and Agriculture

LAND RECORDS ADMINISTRATION REPORT

FOR

Burma

~~THE YEAR ENDING 30TH JUNE 1902.~~

1889-90 to 1900-01

00133918

BOMBAY BRANCH
OF THE
ROYAL ASIATIC SOCIETY.
TOWN HALL, BOMBAY.

Digitized with financial assistance from
Government of Maharashtra
on 01 February, 2020

REPORT

133918

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1889-90. to 1900 -

RANGOON: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, BURMA. OCTOBER 1890.

[Price,—Ten annas.]

00133918

LIBRARY OF THE ROYAL ASIATIC SOCIETY BOMBAY BRANCH

15/3/1

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1889-90.

SECTION I.

MAINTENANCE OF THE VILLAGE RECORDS.

Area under supplementary survey and the cost of the operations.

Supplementary Survey, Lower Burma.—The tract under supplementary survey was the same as in the year 1888-89 in all districts except Akyab. In Akyab the area rose from 1,453 square miles to 1,839 square miles.

2. In the six districts in which the tract under supplementary survey has remained the same as it was in the previous year the area assessed or held under temporary exemption has risen from 2,558,297 acres to 2,655,789 acres (an increase of 3·8 per cent.) and the assessments have risen in the same tracts from Rs. 47,25,844 to Rs. 49,70,822 (an increase of 5·2 per cent.). The increase in the area occupied is large in Pegu (40,926 acres), Bassein (29,567 acres), and in Henzada (9,327 acres). The increase is for the most part due to new lands having been taken up or to fields which had been relinquished owing to floods or other causes being re-occupied, but in Bassein a portion of the increase is due to the supplementary survey being more carefully conducted, some lands which had escaped notice for several years being this year included in the assessed area. The area assessed or held under temporary exemption in the Akyab district at the time of settlement (*i.e.*, 1885—88) was 417,639 acres. As compared with this the present year's figures show an increase of 41,988 acres, while the revenue has in the same time increased by Rs. 73,835.

3. The cost of the supplementary survey operations rose from Rs. 97,212 to Rs. 98,879. The cost per square mile of the tract under supplementary survey, however, fell from Rs. 9-8-9 to Rs. 9-5-9, and that per acre of the area assessed or held under temporary exemption from 6·38 pies to 6·09 pies. The increase in Prome was due to the Superintendent being promoted, and in Bassein to larger payments on account of travelling allowance. The supplementary survey establishments were in no cases increased.

4. The following table* gives the number and salaries of each class of official connected with supplementary survey:—

---

* Required by the Government of India, see paragraph 6 of letter No. 331C.I., dated the 19th March 1890, from the Secretary to the Government of India, Revenue and Agricultural Department, to the Chief Commissioner of Burma.

Statement showing the Number and Salaries of each class of official connected with Supplementary Survey.

District.	Area of tract under supplementary survey.		Salaries of Superintendents.	Inspectors.				Thugyis.				Thugyis' assistant surveyors.				Remarks.
	Gross area.	Area assessed or held under temporary exemption.		Number.	Salary.	Average area of tract under each Inspector.	Average area assessed or held under temporary exemption under each Inspector.	Number.	Average annual earnings.	Average area of circle.	Average area assessed or held under temporary exemption in each circle.	Number.	Salary.	Average area of tract under each surveyor.	Average area assessed or held under temporary exemption in the tract under each surveyor.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Sq.m.	Acres.	Rs.		Rs.	Sq.m.	Acres.		Rs.	Sq.m.	Acres.		Rs.	Sq.m.	Acres.	
Pegu ...	2,018	754,873	400—500	4	60—100	504	188,718	37	2,376	55	20,402	49	30—50	36	11,694*	*In these two districts the holdings are large, and in many circles extensions of cultivation are few and the work is comparatively simple.
Hanthawaddy ...	1,409	476,269	600	4	60—100	352	119,067	34	1,954	41	14,008	38	30—40	37	12,533*	
Tharrawaddy ...	1,096	326,254	200	4	50—80	274	81,563	25	1,348	44	13,050	40	20—45	26	7,768	
Prome ...	701	232,293	300	3	60—80	234	77,431	36	655	19	6,453	26	30—50	25	8,296	
Bassein ...	2,298	531,030	400	7	50—100	328	75,861	34	1,207	68	15,619	51	55†	38	8,850	† Surveyors pay their chainmen in this district out of their salary.
Henzada ...	1,206	335,070	200—225	5	50—80	241	67,014	37	1,247	33	9,056	31	20—50	35	9,855	
Akyab ...	1,839	459,627	200	5	50—100	368	91,925	77	819	24	5,969	52	30—50	31	7,790	
Total or average ...	10,567	115,416	337	32	73	330	97,357	280	1,298	38	11,127	287	40	33	9,828	

N.B.—In calculating the averages in columns 15 and 16 the number of thugyis who required no assistants and of those who took an active part in the survey is added to the number of surveyors given in column 13. Column 16 therefore gives the average area under assessment, &c., dealt with by each surveyor.

5. The thugyi is the circle revenue officer. It is his duty to measure land liable to assessment, to prepare the revenue-roll, and to collect the land revenue. He also collects the capitation-tax, and in some cases other taxes and rents. Where the thugyi is competent, and the circle is not too large, he is permitted to carry on the whole work of supplementary survey alone, but in most cases it is necessary for him to employ an assistant surveyor, and in some cases two assistants are required. These assistants are nominated by the thugyi, but are only employed with the approval of the Superintendent and the Deputy Commissioner. The thugyi's nominee is appointed where possible, but, if he is not qualified, the Superintendent selects another surveyor. It often happens that thugyis ask the Superintendent to select the best surveyor available without themselves nominating any one. The assistant surveyors are removed at the thugyi's request, or when found to be working incorrectly. The salaries of the assistant surveyors are paid out by the Township Officers and deducted from the commission as it becomes due to the thugyis. The thugyi is responsible* for the whole of the additions, amendments, and corrections made yearly on the map. He has to survey extensions of cultivation field by field and to prepare the revised area statement which is in consequence required. He prepares the annual revenue-roll and the other prescribed registers. He may delegate to his assistant any or all of these duties, but he remains responsible for the work as if it had been done by himself.

6. Each Inspector is placed in charge of a group of thugyis' circles. They should annually test the field work done in not less than half the *kwins* (villages) in each circle. They should check not only the surveys of new lands and other changes shown on the map, but also the revenue-roll, the area statements, and the statistics which are annually collected.

7. A Superintendent is appointed in each district to conduct the supplementary survey operations under the orders of the Deputy Commissioner. The Superintendent should annually check the work of his subordinates in each circle. Several of the Superintendents have served in the Survey of India Department. The others have been trained locally. Punishments † are inflicted on officials responsible for maintaining land records by District Officers when necessary. The Superintendents report cases in which punishment is deserved. The Director also points out to the District Officer all serious instances of carelessness or neglect of work which he notices while on tour or in the progress reports and diaries. As a rule notice is promptly taken of communications from the Director, but in the Bassein district the Inspectors have not been sufficiently punished for their neglect of duty, which has been repeatedly pointed out by the Director, and it is believed that the work has suffered in that district in consequence. All officials, except the Superintendents, are appointed and promoted by the District Officers generally on the recommendation of the Superintendents.

Conduct of the thugyis and their assistants in the year under report.

8. There are 280 circles under supplementary survey in Lower Burma. In only 14 circles were the thugyis able to dispense with assistant surveyors, and of the others who were qualified and should have taken an active part in the supplementary survey only 13 have really worked well. The bulk of the work, therefore, is still done by the thugyis' assistants. It is even found that those who after acting as assistants are appointed thugyis at once as a rule give up taking any active part in the field work. The thugyis' assistants have, on the whole, done better than in the year 1888-89. The survey work was particularly heavy. In Pegu large extensions were surveyed and arrears of interior detail work were brought up to date; in Tharrawaddy and Bassein much was done to bring up to date maps of kwins, which had for some time been neglected, and elsewhere the ordinary extensions were surveyed. Many of the young surveyors were found fault with and punished, and this will always be the case. Still there is no doubt but that a large amount of accurate work was done by

* Clause 27 of the Directions.

† Paragraph 5 of letter No. 331C.I., dated the 19th March 1890, from the Secretary to the Government of India, Revenue and Agricultural Department.

them. In many cases their shortcomings, especially in the collection of statistics, are due to the Inspectors not having taken the trouble to explain what is required, and also to this branch of the work being left too long uninspected. The thugyis' assistants for the most part register the statistics accurately. Errors are found by inspecting officers in all districts, but most of the entries are correct. The Pegu statistics are the best, and those collected in Bassein and Prome are the most inaccurate. The thugyis are always urged to be punctual in submitting their revenue-rolls. They should submit two copies of each roll before the 15th February and, if this rule is not observed, land revenue collections fall into arrear. As the revenue-roll can only be prepared after the map for the year has been brought up to date, and the surveyors cannot as a rule take the field before the 1st November, they can only finish the revenue-rolls on the required date by working very constantly for the three months available. This year the revenue-rolls were all punctually submitted in Pegu, Hanthawaddy, and Henzada, but in the other districts a considerable number were brought in late, and in Bassein the copy for the headquarters office was not ready for several months after the proper date, though the Superintendent had been expressly ordered to see that this practice, which is peculiar to Bassein, should cease. The 37 Pegu thugyis submitted all their rolls in duplicate, showing an increase of over 40,000 acres, before the prescribed date. Where the rolls are not ready in time the fault lies not only with the thugyis and their assistants, but the Inspectors and Superintendents who fail to watch the progress being made from the first and to take special measures when necessary for insuring punctuality are also to blame. There is rather a tendency among Superintendents to throw the blame for unpunctuality and bad work of all kinds on the thugyis and the assistant surveyors. The latter are for the most part qualified to do their work well, and where they fail it is often owing to the Inspectors omitting to urge and press them from the first. Young surveyors cannot be trusted without supervision; but, if the large staff of highly-paid experienced Inspectors did their duty, most of the surveyors would do all that could be expected of them.

Conduct of the Inspectors.

9. The most important part of the Inspector's duty in the field season consists in checking the new maps and the revenue-rolls. Under the directions hitherto in force Inspectors were asked to check the work annually in every kwin (village). This was not possible and now they are only required to test half the kwins in each circle annually. In no district has even this proportion been tested, yet the Inspectors in all cases checked the work in many more kwins than in 1888-89, the improvement in this respect being most marked in Tharrawaddy, Prome, and Henzada, though in the last-named district the number of kwins inspected is still far from sufficient. The Bassein Inspectors have done worst of all. They checked 38 kwins each on the average in the field season. In the three best months of the season for inspecting, namely, February, March, and April, the seven Inspectors of this district* tested 39 kwins between them, or rather less than two kwins each a month. Some of them were punished in the end, but the work has without doubt suffered owing to the Deputy Commissioner omitting to notice the shortcomings of these men and to punish them sufficiently when the Director repeatedly drew attention to the way in which the work was being neglected. The quality of the work done by the Inspectors was on the whole good. The improvement has been most marked in Tharrawaddy, and I quite agree with the Deputy Commissioner in thinking that this is due to the exertions of the present Superintendent, Mr. Munro.

Superintendents.

10. The Superintendents of Pegu (Mr. Torrens) and Tharrawaddy (Mr. Munro) have without doubt worked well throughout the season. Progress has been made towards clearing off the arrears of field work in Bassein, but the Inspectors were not required to exert themselves and the statistics were not well recorded and compiled. In Prome the field work on the whole was satisfactory, but the statistics were carelessly collected and compiled. The errors noticed in past years still exist in Hanthawaddy. The standard of work all round fell off in Henzada owing to its being necessary to appoint, as

* Three of the Inspectors were for one month employed in the unsettled circles.

a temporary measure, a Superintendent who was hardly fitted for that post. Maung Tha Do Pru, the Superintendent in Akyab, has done well.

Inspection of supplementary survey by Deputy Commissioners, Subdivisional Officers, and Township Officers.

11. The Deputy Commissioners of all districts but Prome checked a considerable number of kwins. It is not explained why the Deputy Commissioner of Prome was unable to visit more than four kwins. The Deputy Commissioner of Henzada (Mr. Hough) examined the work very thoroughly in the kwins he visited. The number of kwins tested by Subdivisional Officers and Township Officers was 369 as compared with 339 in 1888-89, while the number of such officers increased from 51 to 52. The Subdivisional Officers in Prome did fairly, but the Township Officers in that district and in Akyab did little or nothing. Now and again it is found that Subdivisional and Township Officers check the work thoroughly, but for the most part they select easy blocks, and again and again report that no errors are found in circles where it is known that the work has been done indifferently.

Permanent survey marks.

12. Hitherto the thugyis have been asked to report on all the marks annually. It has never been found possible to have all the marks examined by the thugyis and their assistants in one season, and it has therefore been found necessary to revise the directions regarding the preservation of the survey marks. The present arrangement is as follows. Each circle is divided into three blocks, which are marked off on an index map. The thugyis are ordered to visit all the marks in one of the blocks each year, so that each mark should be examined by the thugyis at least once in three years, whereas under the old system marks in out-of-the-way places might escape inspection altogether. The condition of each mark is shown by certain signs on the 16-inch map and also on 2-inch maps, which are specially kept up for the purpose. From these it is possible to see at a glance the condition of the marks in a circle. The directions were not followed in Bassein and thugyis still examined such marks as they might happen to come across. Elsewhere the marks in the blocks selected for the year have been examined and in some districts (*e.g.*, Pegu, Tharrawaddy, and Henzada) a number of marks in other blocks have been seen to. Most of the marks which were found broken, or which could not be traced, have been replaced, 3,288 new marks being put down in Bassein as compared with 1,044 in the year 1888-89; but in Tharrawaddy many of the missing marks have still to be replaced.

Tracts which it will be necessary to re-survey at the end of the term of settlement.

13. The most important duty of the supplementary survey establishment consists in keeping the maps corrected up to date so as to obviate the necessity of having any special surveys at the end of the term of settlement. There is no doubt whatever but that, when re-settlement becomes necessary, the bulk of the maps that will be supplied by the Land Records Department will be fit to be reproduced without further survey. On the other hand there are tracts in all districts where re-surveys will from various causes be necessary. The extensions of cultivation are being annually shown on the map, but in some cases they are out of position. This is especially the case where the kwins are large (*e.g.*, in North Bassein) and the survey marks have been lost sight of or were put down rather far apart. Again, along the Irrawaddy old islands and banks have cut away, new ones being formed in different positions. All along the Irrawaddy the maps will be found to be incorrect; but, as the changes there are so frequent, it is doubtful if it will be advisable to employ a professional party to re-survey islands which may at any time vanish.

14. Before the field season began the Superintendents were directed to consider this matter and to submit with the annual report an estimate of the area

which would have to be re-surveyed at the end of the term of settlement. The following table gives the particulars for each district :—

District.	Tract under supplementary survey.		Tract which (it is estimated) will have to be re-surveyed at the end of the term of settlement.		Remarks.
	Number of kwins.	Area.	Number of kwins.	Area.	
		Sq. miles.		Sq. miles.	
Pegu	917	2,018	65	80	
Hanthawaddy	917	1,409	116	141	
Tharrawaddy	449	1,096	49	102	
Prome	365	701	26	92	
Bassein	1,241	2,298	77	292	
Henzada	468	1,206	36	117	
Akyab	1,005	1,839	73	17	
Total ...	5,362	10,567	442	841	

NOTE.—Details will be found in the Appendix.

15. It appears then that the Superintendents are of opinion that at the end of the term of settlement it will be necessary to re-survey 841 square miles out of 10,567 in the tract under supplementary survey.

16. This is the first estimate of the kind that has been framed and no doubt, in the years that have to pass before the current term of settlement will lapse, it will be revised from time to time. Still it gives a fair idea of what it will be necessary to undertake when the time does come. The Bassein figures appear to be very high, but there is a very considerable tract in that district in which the work is particularly difficult. The Henzada and Prome figures will be reduced if islands are to be excluded. The Tharrawaddy estimate is probably too high. The Superintendent is new to the district and will perhaps modify his figures when he knows the tract better.

17. Now that this estimate has been framed the attention of Superintendents and Inspectors will be specially directed to the more difficult tracts. This will no doubt lead to good results. The tracts which it is thought will have to be re-surveyed have been marked off on small scale maps and so are not likely to be lost sight of when officers are transferred.

Condition of the records.

18. The supplementary survey records at headquarters are for the most part kept in good order. The record-room at Bassein, however, is badly arranged. Directions have lately issued regarding the method of keeping up the stock-books. Hitherto no forms for stock-books had been prescribed and the books in use were not in all districts regularly written up. It was found too that there was a want of system in the way in which the records in the possession of thugyis were inspected. Defects were often noted without any one taking the trouble to see that they were remedied. Lists of the registers, maps, and other Government property in the possession of thugyis were often not kept up. Inspectors were in the habit of noting in their diaries that they had inspected thugyis' records without giving particulars as to what defects they discovered. The directions that have now issued provide for the more careful custody of the records by thugyis. The rules laid down require Inspectors to examine and report most fully on the condition of all Government property (records included) in the possession of the thugyis, and provision is made for seeing that defects reported are corrected and not lost sight of.

Supplementary survey in Upper Burma.

19. A small tract in the Mandalay district, which had been cadastrally surveyed, was in October 1889 brought under supplementary survey, so that the maps might be brought up to date. The total area taken in hand is only

73 square miles, while the cultivated area is 29,443 acres as compared with 27,784 acres at the time of survey. The cost of survey up to the end of June 1890 was Rs. 4,052, which is very high as compared with the rate in Lower Burma. But this is due to its being impossible to require the thugyis to engage surveyors themselves pending the issue of orders regarding the new revenue rates. It is expected that there will be a considerable increase of revenue owing to this cadastral survey, and when the new rates are sanctioned thugyis can perhaps, in cases where they cannot survey themselves, be required to pay in part at least for surveyors to do the work. There was one Inspector appointed for this supplementary survey and it was superintended by Mr. Gibson in addition to his other duties. All the surveyors were Upper Burmans, who have been trained by Mr. Gibson. Their work was found to be very accurate and better than that done in some parts of Lower Burma where supplementary survey has been in progress for years. The work of supplementary survey in Mandalay is more difficult than in Lower Burma as there are for the most part two crops in a year. Still, from the experience now gained, it appears that it will be possible to start supplementary survey on the completion of each settlement as in Lower Burma and to conduct the operations by local agency.

Cadastral survey by local agency in Lower Burma.

20. *Land records in circles which have not been surveyed.*—The traverse survey was commenced by No. 12 Party in November 1889 in the Hanthawaddy, Prome, and Bassein districts. The area traversed at the end of the field season was 950 square miles, and it is estimated that the total cost of this professional party for the first year will be Rs. 1,33,000. Of this area of 950 square miles a portion is under forest and will not be plotted on the 16-inch scale, and a portion remains for revision.

21. Mr. Clancey, Superintendent of Land Records at Pegu, was appointed to superintend the field-to-field work. The necessary establishment was engaged and was ready to start on the 15th January, on which date it was understood that the professional party would be able to supply a sufficient number of 16-inch traverse maps. Owing to sickness in the camps of the Survey of India party and to other causes the maps were not supplied as early as had been anticipated, and this interfered with the progress considerably. The local surveyors too suffered greatly from fever in the Hanthawaddy district. Still the area of which the detail survey has been completed is 284 square miles, while the cultivated area is 53,978 acres.

22. The total cost of the work up to the end of the recess will probably amount to Rs. 57,844, the cost per acre being Re. 0-5-1. This will no doubt be materially reduced next season, when the men will be more experienced and when sickness will not, it is hoped, prevail to such an unusual extent as was the case this season.

23. The total cost of the traverse party for the year will, it is estimated, be about Rs. 1,33,000. But of the tract which has been traversed only 284 square miles have been taken up by the local parties, and the cost of traversing this portion comes to Rs. 39,718 if we take the same rate per mile for it as is got by applying the total expenditure to the whole tract surveyed. The total cost of survey then of the tract which has been finished by the local surveyors will, at the end of the year, probably amount to Rs. 97,562, or Rs. 343 the square mile. This, however, includes not only the cost of the cadastral survey, but the preparation of the settlement holding registers, the area statements, and maps for the supplementary survey, and the drawing of the maps on lithographic paper.

24. It is not yet possible to say exactly what increase of revenue there will be owing to this survey. It is only when whole circles have been surveyed that a comparison can be made between the areas shown by the thugyis and those found by survey. This is owing to the thugyis not observing any definite village boundaries. In the Prome district some circles have been completed and the increase is 35 per cent. It is probable that there will be an increase of not less than 30 per cent. all round. It may be expected that the area under assessment in the tract already surveyed will increase by some 16,000 acres. The revenue rates are moderate and it is not thought that it will be necessary to reduce them in any case. The revenue demand on 16,000 acres would be about Rs. 25,000 and

that is the amount of the gain to Government due to the survey so far as it can at present be estimated. Considering that this is the first season in which the survey was carried on in this method, that the maps were received later than was expected, and after they were received the party suffered greatly from sickness, the result appears to be satisfactory.

25. Mr. Clancey had many difficulties to encounter and he deserves much credit for having overcome them. He had to begin with engaging his establishment, the party being entirely new. Work was started in three districts and in each he had to depend on a Burman assistant. These officers are thoroughly trained surveyors no doubt, but had no experience in the management of parties of men. They did not at first understand accounts, nor the preparation of the necessary returns, and the assistance which Mr. Clancey derived from them was not such as a Deputy Superintendent in a Survey of India party would have had from his assistant surveyors.*

Holding surveys.

26. Surveys by holdings on the plan, which in the preceding year had been tried in the Shwegyin district, were undertaken in four districts in the year under report. The result of the survey in Shwegyin, Toungoo, and Sandoway is given in the following table:—

District.	Area assessed or held under temporary exemption and revenue demand.				Increase in 1890.		Percentage of increase.	
	As given by the thugyis in 1888-89.		*As found by survey in 1889-90.*					
	Area.	Revenue demand.	Area.	Revenue demand.	In area.	In revenue.	In area.	In revenue.
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Per cent.	Per cent.
Shwegyin ...	64,735	1,03,727	96,035	1,50,040	31,300	46,313	48	45
Toungoo ...	32,338	43,185	43,724	65,226	11,386	22,041	35	51
Sandoway ...	20,388	29,766	25,618	40,290	5,230	10,524	26	35
Total ...	1,17,461	1,76,678	165,377	2,55,556	47,916	78,878	41	45

The survey in these three districts then has resulted in an increase of 47,916 acres (or 41 per cent.) in area and of Rs. 78,878 (or 45 per cent.) in the revenue demand. A similar survey was conducted in the Salween district, where an area of 3,810 acres was surveyed. As the assessment there had not been on the acreage, but, as in the case of hill clearings, at a fixed rate for each cultivator, it is not possible to compare the survey area with that on which former assessments were based.

27. The cost of the inspection staff was paid by Government, while the thugyis were required to survey or pay for the surveyors, except in certain cases in which it was thought advisable for Government to pay for the surveyors owing to the thugyis being poor. The actual cost of survey was as follows:

District.	Cost of survey incurred by		
	Thugyis.	Government.	Total.
	Rs.	Rs.	Rs.
Shwegyin	4,628	3,189	7,817
Toungoo	1,707	1,742	3,449
Salween	...	1,076	1,076
Sandoway	...	5,476	5,476
Total ...	6,335	11,483	17,818

28. Enquiry has been made about the revenue rates in force in the circles surveyed this season. It has been decided that there is no necessity for revising the rates in Shwegyin and Toungoo. In the other districts enquiries regarding the

*Mr. Clancey's report on the cadastral survey carried on by him is given in the Appendix.

rates are still being conducted, but it is not likely that any material change will be made.

29. The officers in charge of the Shwegyin and Toungoo surveys were survey school teachers. A considerable number of the surveyors had obtained their certificates in their schools. Both these officers worked well. In Sandoway the survey was conducted by an Inspector of Land Records transferred temporarily from Prome.

30. In all cases the Deputy Commissioners took much interest in the work. This was especially the case in the Shwegyin district, where the Deputy Commissioner, Mr. Maxwell, and the Subdivisional Officer, Mr. Carmichael, tested the measurements in several circles, and in Toungoo, where Mr. Midwinter also checked the work, while in Sandoway Mr. Houghton has undertaken a thorough enquiry into the revenue rates.

31. Mr. Clancey, Superintendent of Land Records, visited Sandoway at the beginning of the season and assisted in organizing the staff and starting the survey. The Director of Land Records visited Shwegyin and Toungoo districts in the field season and tested the work.

Checking of thugyis' areas in circles where no surveys have been made.

32. The district surveyors and, in the districts which are partly under supplementary survey, the Superintendents and Inspectors of Land Records have as usual checked thugyis' areas. The results will be given in the Revenue Administration Report. Such checking, where there are no maps, is believed to be of but little value.

Supplementary survey in unsettled circles.

33. Where holding surveys have been conducted it has been decided to keep the maps up to date year by year, just as the cadastral maps are kept up in the districts which have come under regular settlement. This supplementary survey will, as far as possible, be conducted in the same method as in the settled districts. A new map of each kwin (village) will be prepared every year and the changes will be regularly shown on it. The thugyi will be responsible for the survey, and if he is not a competent surveyor, he will be required to engage a qualified assistant. Inspectors will be appointed to supervise and check the work.

34. This supplementary survey* is just being started in the Pyuntaza subdivision of the Shwegyin district and will next year be extended to the Kyaikto subdivision in that district, and to the Toungoo and Sandoway districts. As in the year of survey the thugyis have to incur considerable expense it is thought advisable to allow one season to elapse after survey before introducing the supplementary survey. It always happens that there is this interval in the case of circles regularly settled and no serious inconvenience results.

Survey of State land and of private land paying irrigation rates.

35. The following table shows the area of State land surveyed by local agency in Upper Burma in the past field season :—

District.	Area under assessment in acres.		Increase in area.		Remarks.
	As shown by local officials.	As found by survey.	Acres.	Per cent.	
	Acres.	Acres.			
Mandalay	621	1,694	1,073	172·79	
Shwebo	3,274	15,384	12,110	369·88	
Sagaing	3,050	7,725	4,675	153·28	
Meiktila	3,814	8,671	4,857	127·35	
Pakôkku	5,097	11,773	6,676	130·98	
Minbu	5,236	13,542	8,306	158·64	
Total ...	21,092	58,789†	37,697	178·72	†Exclusive of 1,181 acres in Ye-u.

* In paragraph 1 (last sentence) of letter No. 205-28—1R., dated the 7th May 1890, the Under Secretary to the Government of India, Revenue and Agricultural Department, enquires what measures are being taken in this direction.

36. In addition an area of 22,195 acres of non-revenue paying lands, such as waste village-sites, &c., were surveyed. It is estimated that at the close of the recess the cost of this survey will amount to Rs. 20,182,* which gives an average cost of 3·99 annas the acre for the gross area and of 5·49 annas the acre on the assessed area. This, however, includes the cost of preparing the revenue rolls and holding registers. The oil-field survey party, whose work is in progress, completed 20,000 acres up to the 30th June 1890.

37. All these surveys were under Mr. Gibson's† supervision. Some of the Inspectors and surveyors were sent up from Lower Burma. Others were men who had been taught by Mr. Gibson himself in Mandalay. Mr. Gibson deserves credit for his good management of the work in charge of which he was placed.

38. *Survey Schools.*—Since the beginning of the year 1890 survey schools have been opened at Sagaing, Yamèthin, and Minbu in Upper Burma, and at Tharrawaddy and Ma-ubin in Lower Burma. The demand for Burman surveyors is constant both in Upper and in Lower Burma. During the year under report 180 Burmans passed the Syndicate examination in surveying, of whom 131 were trained in the Government survey schools. In 1888-89 223 candidates passed and in 1887-88 only 122. The young surveyors have to a large extent been employed (*a*) in supplementary survey work, (*b*) in the cadastral survey by local agency in Lower Burma, (*c*) in other revenue surveys both in Lower and Upper Burma.

SECTION II.

Analysis of Districts with reference to Security against Famine.

39. District Officers have been asked to revise the analysis as they get further information and supplementary statements have been received from two districts.

SECTION III.

System of Collection of Revenue in Precarious Tracts.

40. No change has been made in the method for granting remission of revenue.

SECTION IV.

Fodder Reserves and Arboriculture.

41. During the year under report the area reserved ‡ for grazing was added to in the Akyab, Pegu, Thôngwa, Bassein, Henzada, and Shwegyin districts.

42. Except in the districts which have been cadastrally surveyed, there are as a rule no satisfactory maps of the reserves nor are the marks regularly looked after. In the settled districts the grazing-grounds are marked on the cadastral maps and they are inspected by the officers of the Land Records Department. In the Pegu district out of 2,020 marks on the boundaries of grazing-grounds 104 were found broken or missing, and of these 96 were replaced. There were 52 cases of encroachment, in all of which the persons concerned were evicted. In Tharrawaddy proposals are being made for reserving more grazing-grounds throughout the district. Prosecutions were instituted in several cases where encroachments were noticed. The boundary marks, which had for the most part been lost sight of in this district, were replaced and those in Prome were kept in good order. Encroachments were reported in a few instances in Bassein and the offenders were fined or warned. In Akyab, though only one encroachment was noticed, it was found that in some cases the marks were taken up and removed.

* This does not include Rs. 1,440, the cost of the survey in Ye-u (1,181 acres).

† A fuller account of these surveys will be found in the Appendix in a report on them written by Mr. Gibson.

‡ Further particulars are given in the Revenue Administration Report.

SECTION V.

Agricultural Experiments.

43. *Lashio Experimental Farm.*—As noticed in last year's report the proposal to undertake agricultural experiments at Lashio in the Northern Shan States was sanctioned. Mr. Hillier, who has passed through the Madras Agricultural College, was appointed to take charge of the farm at the request of Mr. Daly, the Superintendent of the Northern Shan States, who himself has taken a very keen interest in the experiments, and with whom indeed the proposal originated. For the year under report a sum of Rs. 5,649 was sanctioned for the farm and the budget provision in the present year is Rs. 20,000.

44. Shortly after Mr. Hillier's appointment definite proposals were drawn up by him and forwarded by Mr. Daly (the Superintendent of the Northern Shan States) with an expression of his own opinion. It was proposed to take up about 100 acres of land, some 50 acres to be put under wheat, 8 under pulses, 7 under oats and other cereals, while oil-seeds, hemp, cotton, and tubers were also to be tried. The necessary seeds and implements were at once ordered from India and in August Mr. Hillier came down to Rangoon to superintend the packing of the seeds, &c., and to take them up himself to Lashio. The land that was taken up for the farm was covered with a heavy growth of grass and bushes, and was apparently fertile. It was cleared and ploughed first with Shan ploughs and then with Avery's stock-ploughs. By the middle of November some 60 acres had been ploughed and sown with wheat and other grains. Little or no rain fell in November and December, and the weather was hot and sultry, while heavy dew fell at night. From the information obtained locally it was expected that there would be some rain and the season was no doubt abnormal. None of the crops succeeded. In nearly all cases the seed germinated well, but later on the plants withered for want of moisture. Most of the wheat seed was got from Sagaing in Upper Burma, and it is now believed that this seed is not suitable and that it would have been better if the seed had been obtained from India. Though the experiments failed there is no reason for believing that wheat cannot be successfully grown at Lashio and an expenditure of Rs. 20,000 has been sanctioned for the year 1890-91. It is proposed to continue the experiments in the same place. As before it is intended to pay most attention to wheat cultivation, but barley, oats, maize, millets, pulses, tobacco, cotton, oil-seeds, and miscellaneous and garden crops are also to be tried. Sheep have been purchased and are so far doing well. Cows are to be bought for dairy purposes. A bull has been purchased and is to be shortly sent up to Lashio. It is proposed to engage salutries in India, and a blacksmith and carpenter are also being procured. They are much required not only to keep the farm implements in order, but to set up water-mills. There is good reason for hoping that as Mr. Hillier has now had some local experience he may obtain considerable success in the current year.

Seed supplied for experimental cultivation.

45. Wheat seed was supplied for experimental cultivation in the Southern Shan States, Shwebo, Ye-u, and Meiktila. In the Southern Shan States wheat was sown in four States, namely, Nyaungywe, Banyin, Thatôn, and Yatsauk. Wheat supplied to two others, Naungmôn and Pindaya, arrived too late to sow. The outturn in Thatôn was 30 bushels from one bushel of seed sown in September. In the other States the seed was sown too late and the outturn was very small, namely, in Nyaungywe three bushels of seed sown in November yielded one bushel, in Danyin three-quarters of a bushel was sown in December with no result, and in Yatsauk six bushels sown in February yielded nine bushels. Though the experiments for the most part failed and much of the seed sent up in the middle of September could not be distributed in time, it would appear from the result reported at Thatôn that wheat can be successfully grown in the Shan States. In the Ye-u district wheat was distributed in a township where the villagers had formerly grown it, but had abandoned its cultivation, and to Captain Hutchinson, the Battalion Commandant, while Mr. Calogreedy also attempted to grow some from seed obtained in the adjoining district of Sagaing,

where wheat is annually cultivated. The crop in all cases failed, and the Deputy Commissioner attributes the result to the seed not being in good condition, to the ground not having been properly prepared, and to the fact that no rain fell in January and February. The reasons for the failure in the case of the land planted under Captain Hutchinson's supervision, however, were different. Three fields, after being very carefully prepared, were sown on the 20th October, but before the grain had time to germinate very heavy rain fell and drowned the whole crop, except a little on higher land, which did well all through and yielded fairly. The fields were sown again early in November. Shortly after that the crop was partially spoilt by rain: it was then attacked by whiteants, to drive off which the fields were irrigated by means of a Persian wheel, but too much water was, it is thought, applied and the crop withered. The outturn was only 2¾ maunds from 1½ maunds of seed.

46. Tobacco seed was supplied to the following districts, namely, Ye-u, Kyauksè, Sagaing, and Upper Chindwin. The Deputy Commissioner of Kyauksè did not distribute the seed as it was received, he thought, too late. The Civil Surgeon of the Upper Chindwin reports as follows on the tobacco grown from Havanna and other seed supplied to the Deputy Commissioner of that district:—

"Both varieties were planted in unmanured virgin soil. They grew luxuriantly and beautiful large leaves were gathered. I believe a bigger crop would have been gathered if we had planted the seed earlier. The soil throughout the Upper Chindwin appears to be just suited for the cultivation of tobacco, and with a little encouragement I am of opinion that as good tobacco as that produced at Coringa, Dindigul, and even Java could be grown here, and in such quantities as not only to supply the wants of the inhabitants, but to export it to those very countries whence we are now importing."

47. Barley and oats seed was supplied to the Deputy Commissioners of the Upper Chindwin and Shwebo districts. In Shwebo 50lbs. of oats seed was sown in November and the yield was 134lbs. The barley seed was sown in a "good "piece of ground likely to be productive, but owing to the want of rain and the "impossibility of irrigating it the barley dried up when still young." The barley and oats sown in the Upper Chindwin district yielded twice the weight of the seed sown.

48. Maize seed was distributed for cultivation in the Bhamo, Shwebo, Sagaing, Upper Chindwin, and Meiktila districts. In Bhamo the experiment failed partly owing to the plants being attacked by caterpillars and partly owing to rain being very heavy. In Shwebo the seed was sown in black cotton soil. The plants were strong and the yield heavy. In the Upper Chindwin the maize did not succeed for what reason it is not known, and in Meiktila district, while the crop was good in Meiktila township, it for the most part failed elsewhere, the "result of the experiment being," as the Deputy Commissioner remarks, "practically of no value owing to the lateness of the rains."

49. Potato seed was supplied for distribution in the Shwebo and Meiktila districts. At Meiktila the seed was sown in the jail garden and the result was very successful. The Superintendent of the jail has asked to be supplied with seed again this year, for which his department will pay.

50. Captain Hutchinson, the Battalion Commandant at Ye-u, grew potatoes from seed which he procured from Calcutta and Rangoon. The best crop was sown in December and it promised well until it was attacked by red ants. The field was then flooded and so the ants got rid of, but the plants mostly died. A good crop of very fair sized tubers was, however, got from such plants as survived.

51. Vegetable seed was distributed in several districts. In Mandalay English vegetables were most successfully grown. In the Upper Chindwin English vegetables were tried, and the Civil Surgeon remarks that cabbage grew well and some very fine heads were obtained, while "beetroot, turnips, carrots, and "raddish did fairly well. The peas were plump, large, and sweet. The lettuce "juicy and very grateful to the palate, and better could not be wished for." The Deputy Commissioner of Pakôkku reports that English vegetable seeds were sown on the river bank at Yesagyo on land yearly flooded by the Chindwin river. Raddish, beet, kohlrabi, and lettuce succeeded very well, and cabbage, turnips, and peas fairly.

52. The experimental plantation at Mergui is as before kept up under the supervision of the Forest Officer. The number of plants of Liberian coffee was 3,372, or 757 more than last year. Coffee was sold at rates varying from 7 to 9 annas the pound. The Deputy Conservator of Forests reports that "Mr. Wat-"son, a planter at Tavoy, who saw the coffee in fruit this year, says he never saw "anything so good in Ceylon and estimated the crop at, at least, 8 cwt. the acre. "That only 3 cwt. the acre was obtained is explained by the fact that the plot is "not half stocked with mature plants." The vanilla remains healthy; the flowers were for the first time properly fertilized and 270 healthy pods were obtained. Tea is cultivated in too small a scale to serve any useful purpose. Cardamoms failed, but pepper is succeeding very well.

53. *Agricultural Shows.*—Agricultural shows were held in March 1890 in Pegu and Tharrawaddy districts in Lower Burma. The Prize Committee in each case consisted of the Deputy Commissioner, the Veterinary Instructor, and the Township Officer, and in Tharrawaddy the Superintendent of Land Records and the Subdivisional Officer also took part.

54. In Pegu the show of bullocks was very good. There were 27 stacks of straw entered as exhibits and the Committee saw large numbers of such stacks which were not entered.

55. The cattle show in Tharrawaddy was a decided success. The Veterinary Instructor (Mr. Frost) was of opinion that it would be "difficult to collect a finer lot of plough and draft bullocks than those brought together" at the Tharrawaddy show. The Deputy Commissioner considers that the shows have encouraged the cultivators to stack their straw for use as fodder. Seven wells were entered for competition in Tharrawaddy and they were on the whole good.

56. As the shows have hitherto been so successful it has been determined to hold others in Upper Burma as well as in Lower Burma. Since the close of the year a show has been held in the Upper Chindwin district, and it is proposed to have another there at the end of the year. Shows are also to be held in the districts in the Southern division in Upper Burma, and in the Tharrawaddy, Hanthawaddy, and Thôngwa districts of Lower Burma.

57. At all these shows it is proposed to give prizes for ponies, as well as for buffaloes, oxen, and the other classes of exhibits which have hitherto been entered.

Export of animal bones.

58. Some enquiries have been made about the export of animal bones * and the extent to which they are collected in Burma. The following table, which has been supplied by the Chief Collector of Customs (Rangoon), shows the exports of bones from Burma in the last six years:—

To what country exported.	Year of export.											
	1884-85.		1885-86.		1886-87.		1887-88.		1888-89.		1889-90.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.
United Kingdom...	...	...	50	2,480	80	3,200	...	...	...	...	...	...
China ...	·73	2,200	...	...	15	418	28	1,198	32	1,541	46	4,560
Straits ...	126	10,474	69	3,246	13	414	43	1,980	162	9,876	115	8,079
Total ...	199	12,674	119	5,726	108	4,032	71	3,178	194	11,417	161	12,639

* This information was asked for in Circular No. 67-112—1A. from the Secretary to the Government of India, Revenue and Agricultural Department, dated the 4th October 1889, which was received after the last annual report of this department had been written.

59. The exports of animal bones do not appear to be increasing in Burma and the amount exported is but small. Messrs. Cowie and Co.* have for several years manufactured manures from bones in their mill at Danidaw (Rangoon). The bones are collected from several districts, a large quantity having once been procured from Prome. They, however, always purchase at their godowns and so do not always know where the bones come from, but only a small proportion of the bones purchased are contributed by Rangoon. The bones are crushed and ground to a coarse powder, which is sometimes exported. But for the most part it is treated with sulphuric acid and mixed with other substances, and then exported as manure. It is used for tobacco and sugarcane in the Straits Settlements. Messrs. Cowie and Co. have failed to persuade Burmese cultivators to try their manures.

60. The bones which Messrs. Cowie and Co. purchase are probably for the most part those of animals slaughtered for human consumption, but also, I presume, those of animals which have died naturally. Enquiries made in several districts have so far failed to obtain information as to the collection of bones except at slaughter-houses. Cattle-owners and cultivators invariably say that the bones of cattle which die in the villages are not collected by any one.

SECTION VI.

Veterinary Establishments and Cattle-breeding.

61. *Veterinary Establishments.*—There were 16 veterinary assistants employed in Burma in the year under report. Of these two were posted to each of the following districts, namely, Bassein, Thôngwa, Hanthawaddy, Amherst, and Thayetmyo, and the others to different districts in Lower Burma. But it became necessary to move them about in Lower Burma from district to district as cattle-disease appeared; and, even so, it was not possible on all occasions to comply with the wishes of Deputy Commissioners. Some of the assistants too were deputed to Upper Burma, where the mortality of cattle was very high. The Veterinary School is shortly to be re-opened and there will probably be a sufficient number of qualified veterinary assistants available in the near future.

62. It is reported that in the year under report there were 7,556 animals treated by the veterinary assistants, and 5,874 were cured and 793 died. For rinderpest there were 1,815 animals treated and only 848 were cured. A large number of cases of foot-and-mouth disease were treated and the mortality was exceedingly small.

63. In Lower Burma the mortality of cattle was on the whole lower than it had been in the year 1888-89, and this was especially the case in the Arakan and Tenasserim divisions, but the outbreaks of rinderpest in Pegu, Tharrawaddy, Bassein, Henzada, and Thayetmyo districts were severe. The registration of deaths of cattle has improved. The monthly returns now give not only the numbers of buffaloes and bullocks that have died, but also the value.

64. During the year three stallions were purchased for Municipalities or Town Committees in Lower Burma and six by Government for Upper Burma. Three stallions died and two were sold as being useless. In Lower Burma the stallions have proved useful. But it is too early to judge of the probable results of the plan which is being tried of supplying stallions for stations where there are mounted police in Upper Burma. It appears to be in some cases considered that the Police Department lose the services of the mares for such a long time before and after foaling that the plan cannot be persisted in with advantage. This matter is now under consideration, as is the best method of rearing the foals. As so many of the imported stallions die it has been proposed to select Burma pony stallions for stud purposes, but none have yet been bought.

65. The sheep farm at Allanmyo, kept of late by a Madrassi, has been abandoned. The sheep suffered much from an epidemic and the owner did not care to persist in the experiment. Sheep are now successfully kept in the experimental farm at Lashio in the Northern Shan States and there is every prospect of good results following their introduction in that part of the country.

* Messrs. Cowie and Co. have kindly supplied this information.

SECTION VII.

Agricultural and Fiscal Statistics.

6. The agricultural statistics which are required for the General Administration Report were checked and finally compiled under the supervision of the Director of Land Records. Tables showing details by circles of sales, mortgages, and prices in the tracts under supplementary survey were prepared as in previous years. The weekly crop reports have been submitted as usual and, in all cases where the reports appeared to be open to doubt, explanations were called for. Now and again it was necessary to point out that the particulars given were not full enough, there being a tendency to report only the rainfall and prices, and to omit all reference to standing crops and the progress of agricultural operations. It was also found in some instances that there were errors in the rainfall figures. In the most part, however, the reports were properly prepared and punctually submitted.

67. Every month a note on the food-supply in Burma is issued. Whenever there is any reason to expect that the supply of food grain is likely to fail in any district the fact is noticed and the prices of rice and other grain at the beginning and the end of the month are given.

68. The returns containing the prices-current of food-grains are as a rule punctually submitted. In a few cases it was necessary to telegraph for those which remained overdue for some days. Deputy Commissioners were asked to make further enquiry in cases where the prices given appeared to be open to doubt, but for the most part it was found that the prices first given were correct.

SECTION VIII.

Trade Statistics.

69. *Inland trade registration.*—The registration of inland trade was transferred from the Chief Collector of Customs to the Director of Land Records in May 1889. The registration of boat trade at the frontier between Upper and Lower Burma had already been abolished, as had that of trade by land in the Kyaukpyu, Thayetmyo, and Toungoo districts. Registration of trade on the frontier of Upper Burma, in the Bhamo, Mandalay, and Meiktila districts, was established at the same time and has since been carried on.

70. *Crop estimate.*—The usual estimates of the amount of rice likely to be available for export were prepared. In January 1889 it was estimated that there would be 1,111,800 tons of *cargo* rice available for export. The actual exports for the year 1889 are said to have amounted to 1,063,000 tons, but this does not include the exports to Upper Burma by boat, which cannot be given as the boat trade is no longer registered. It is probable, however, that there were 10,000 to 15,000 tons of grain taken up by boat.

71. The amount of cargo rice likely to be available in 1890 was, in the report for December 1889, estimated at 1,260,000 tons. In the report for January this was reduced to 1,220,000 tons owing to rain having fallen, which damaged the grain on the threshing-floors. The estimate was still further reduced in a special report for February to 1,180,000 tons owing to its being reported that the crop had been even more seriously damaged than had been at first reported. The actual exports to the end of September were about 1,150,000 tons. There remain for export some 1,10,000 tons and it is probable that the total exports for the year will be about 1,260,000 tons. The amount of grain destroyed by rain was much less than was at first estimated and a good demand arose for even badly damaged grain.

SECTION IX.

General.

72. Mr. Torrens became Superintendent of Land Records in Pegu in the place of Mr. Clancey at the end of September 1889, when the latter was placed

on special duty under the Director to supervise the cadastral survey by local agency in Hanthawaddy, Prome, and Bassein districts. At the close of the year Mr. Seaton, Superintendent of Land Records, took privilege leave and his place was taken by Maung Ba Ôn. In Thamrawaddy Maung San Dun remained in charge as Superintendent of Land Records until the 7th July, and after Maung Pyu Than had acted as Superintendent for a short time Mr. Munro assumed charge, his place at Akyab having been taken by Maung Tha Do Pru in July 1889. In Henzada Maung Po Pyu was appointed Superintendent as a temporary measure in the place of Maung Po Bye. In Bassein Mr. Ford, the Superintendent, took privilege leave for a month in the early part of 1890, his place being taken by one of his Inspectors. In Upper Burma Mr. R. A. Gibson was in charge of all local surveys throughout the year.

W. T. HALL,

The 15th October 1890.

Director of the Department of Land Records and Agriculture.

APPENDICES.

DEPARTMENT OF LAND RECORDS AND AGRICULTURE.

A.—*Area under Supplementary Survey and Cost of the Operations.*

1	2		3		4		5		6		7		8		9		
District.	Number of circles.		Total area in square miles.		Area assessed or held under temporary exemption. Paddy.		Garden and miscellaneous cultivation.		Total.		Actual cost of supplementary survey operations in		Cost per square mile of total area.		Cost per acre shown in column 6.		Remarks.
	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.	
					Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs. A. P.	Rs. A. P.	Pies.	Pies.	
Pegu ...	37	37	2,018	2,018	703,342	743,401	10,605	11,472	713,947	754,873	17,155	17,369	8 8 0	8 9 9	4·61	4·42	
Hanthawaddy ...	34	34	1,409	1,409	436,644	443,878	31,838*	32,391	468,482*	476,269	17,869*	17,756	12 5 3	12 9 8	7·12	7·16	
Tharrawaddy ...	25	25	1,096	1,096	308,910	313,897	10,691	12,357	319,601	326,254	10,011	10,811	9 2 2	9 13 10	6·01	6·36	
Prome ...	39	36	701	701	210,552	212,899	18,509	19,394	229,061	232,293	9,442	10,518	13 7 6	15 0 1	7·91	8·69	
Bassein ...	34	34	2,298	2,298	478,182	505,777	23,281	25,253	501,463	531,030	17,869	18,643	7 12 5	8 1 10	6·84	6·74	
Henzada ...	38	37	1,206	1,206	288,014	292,783	37,729	42,287	325,743	335.070	11,293	10,977	9 5 10	9 1 8	6·66	6·29	
Akyab ...	80	77	1,453	1,839	345,281*	432,836	20,954*	26,791	366,235*	459,627	14,073	12,805	9 11 0	6 15 5	7·38	5·35	
Total ...	287	280	10,181	10,567	2,770,925	2,945,471	153,607	169,945	2,924,532	3,115,416	97,212	98,879	9 8 9	9 5 9	6·38	6·09	

* Revised figures.

B.—*Assessments in the tract under Supplementary Survey.*

1	2		3		4		Remarks.
District.	Paddy-land.		Garden and miscellaneous.		Total.		
	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Pegu	14,07,466	15,19,409	23,319	25,056	14,30,785	15,44,465	
Hanthawaddy	9,91,893	10,39,382	83,278	83,293	10,75,171	11,22,675	
Tharrawaddy	5,33,235	5,29,808	23,207	27,307	5,56,442	5,57,115	
Prome	2,22,462	2,22,132	46,520	48,479	2,68,982	2,70,611	
Bassein	7,42,734	8,13,180	44,849	48,032	7,87,583	8,61,212	
Henzada	5,34,692	5,38,853	72,189	75,891	6,06,881	6,14,744	
Akyab	7,28,773	8,93,113	42,335	54,690	7,71,108	9,47,803	
Total ...	51,61,255	55,55,877	3,35,697	3,62,748	54,96,952	59,18,625	

C.—*Agency by which the Supplementary Survey was conducted.*

1	2	3	4	5	6	7
District.	Number of circles.	Number of thugyis who have qualified in surveying.	Number of thugyis who actually took part in supplementary survey.	Number of circles in which thugyisayes were employed.	Number of circles in which it was necessary to employ two thugyisayes.	Remarks.
Pegu ...	37	30	37	35	4	* Extra surveyors were employed temporarily.
Hanthawaddy ...	34	25	34	34	9*	
Tharrawaddy ...	25	8	5	25	16	
Prome ...	36	12	22	34	1	
Bassein ...	34	20	20	34	14	
Henzada ...	37	26	26	34	1	
Akyab ...	77	16	7	70	3	
Total ...	280	137	151	266	48	

D.—*Supplementary Survey Inspection.*

District.	Year.	Number of kwins in tract under supplementary survey.	Number of kwins in which field work was checked by the Superintendent.	Work done by Inspectors.				Work done by Subdivisional Officers.			Work done by Township Officers.		
				Number of Inspectors.	Number of kwins checked.	Average.	Total number of kwins field work of which was checked by Land Records staff.	Number of kwins the field work of which was checked by the Deputy Commissioner.	Number of Subdivisional Officers.	Number of kwins checked.	Average.	Number of Township Officers.	Number of kwins checked.	Average.
Pegu	1888-89	917	47	4	219	55	236	96	2	12	6	6	78	16
	1889-90	917	61	4	269	67	317	23	2	10	9	5	52	10
Hanthawaddy	1888-89	917	53	4	220	55	273	24	1	5	5	4	28	7
	1889-90	917	59	4	290	72	349	36	1	7	7	4	28	7
Tharrawaddy	1888-89	449	30	4	131	33	142	7	1	...	...	4	16	4
	1889-90	449	57	4	187	47	244	14	1	...	...	4	39	10
Prome	1888-89	365	76	3	106	35	182	28	3	19	6	5	24	5
	1889-90	365	82	3	176	59	260	4	3	23	8	5	9	2
Bassein	1888-89	1,241	34	7	177	25	198	11	2	12	6	8	33	4
	1889-90	1,241	63	7	268	38	317	14	2	27	13	8	88	11
Henzada	1888-89	468	41	5	147	29	188	4	2	29	14	5	68	14
	1889-90	468	59	5	218	44	277	21	2	16	8	5	46	9
Akyab	1888-89	872	58	5	264	53	329	15	2	...	...	7	15	2
	1889-90	1,005	49	5	429	86	478	11	2	7	3	8	8	1
Total	1888-89	5,229	339	32	1,264	39	1,561	115	13	77	6	38	262	7
	1889-90	5,362	430	32	1,839	57	2,242	123	13	99	8	39	270	7

E.—*Result of Corrections.*

District.	Effect of corrections.								Remarks.
	Total increase.		Total decrease.		Net increase.		Net decrease.		
	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	
1	2	3	4	5	6	7	8	9	10
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	
Pegu ...	354	1,288	313	1,380	41	...	...	92	
Hanthawaddy	320	915	140	376	180	539	...	...	
Tharrawaddy	1,297	2,228	919	1,792	378	436	...	...	
Prome ...	94*	116	21	130	73	...	...	14	* The increase due to the Superintendent is 76 acres.
Bassein ...	991	1,773	547	1,043	444	730	...	...	
Henzada ...	559	1,116	101	273	458	843	...	...	
Akyab ...	378	1,591	51	663	327	928	...	...	
Total ...	3,993	9,027	2,092	5,657	1,901	3,370	...	...	

F.—*Tables showing the nature of the errors found by the Superintendents and Inspectors.*

(*a*) New plots wrongly surveyed.

District.	Number of new fields or plots checked by Superintendent or Inspectors.	Number of such plots in which errors were found.			Remarks.
		Errors amounting to half an acre or more.	Errors of less than half an acre.	Total number of errors.	
1	2	3	4	5	6
Pegu ...	2,985	65	342	407	
Hanthawaddy ...	1,444	186	354	540	
Tharrawaddy ...	3,167	129	1,201	1,330	
Prome ...	166	2	43	45	
Bassein ...	818	123	224	347	
Henzada ...	1,607	221	308	529	
Akyab ...	642	38	91	129	
Total ...	10,829	764	2,563	3,327	

(*b*) Omissions to survey new plots.

District.	Number of new plots found not surveyed.			Remarks.
	Errors amounting to half an acre or more.	Errors of less than half an acre.	Total number of errors.	
1	2	3	4	5
Pegu	117	693	810	
Hanthawaddy	102	428	530	
Tharrawaddy	91	918	1,009	
Prome	4	243	247	
Bassein	432	761	1,193	
Henzada	265	525	790	
Akyab	107	801	908	
Total ...	1,118	4,369	5,487	

F.—*Table showing the nature of the errors found by the Superintendents and Inspectors* —continued.

(c) Errors in marking fallows.

District.	Number of fields marked fallow that were checked.	Fallow fields shown as cultivated.			Cultivated fields shown as fallow.			Remarks.
		Errors amounting to half an acre or more.	Errors of less than half an acre.	Total number of errors.	Errors amounting to half an acre or more.	Errors of less than half an acre.	Total number of errors.	
1	2	3	4	5	6	7	8	9
Pegu	10,320	234	948	1,182	66	101	167	
Hanthawaddy ...	7,023	85	264	349	39	81	120	
Tharrawaddy ...	14,552	183	1,403	1,586	13	169	182	
Prome	1,550	104	529	633	4	108	112	
Bassein	7,509	289	1,340	1,629	82	584	666	
Henzada	13,119	264	1,484	1,748	174	420	594	
Akyab	17,481	261	2,940	3,201	26	423	449	
Total ...	71,554	1,420	8,908	10,328	404	1,886	2,290	

(d) Lands wrongly classified and errors in field boundaries in the interior of holdings.

District.	Classification of land.		Interior holding boundary errors.		Remarks.
	Number of holdings visited.	Number of holdings in which land was found wrongly classified.	Number of boundaries checked.	Number of boundaries in which errors were found.	
1	2	3	4	5	6
Pegu	2,896	44	4,147	180	
Hanthawaddy ...	136	2	5,070	34	
Tharrawaddy ...	7,338	514	64,560	4,455	
Prome	528	50	4,899	879	
Bassein	3,605	108	53,095	709	
Henzada	315	134	51,727	1,685	
Akyab	1,474	50	9,435	390	
Total ...	16,292	897	192,933	8,332	

F.—*Table showing the nature of the errors found by the Superintendents and Inspectors* —concluded.

(*e*) Errors in noting sales, transfers, and subletting of land.

District.	Tenant statistics.		Statistics of sales, transfers, mortgages, &c.		Remarks.
	Number of cases of subletting checked.	Omissions to note, or errors in showing tenancies.	Number of cases in which sales, transfers, and mortgages were checked.	Omissions to show, or errors in noting terms of sales, transfers, and mortgages.	
1	2	3	4	5	6
Pegu	2,147	291	546	83	
Hanthawaddy	2,358	286	1,791	144	
Tharrawaddy	2,306	402	1,048	176	
Prome	901	155	1,059	151	
Bassein	746	72	96	11	
Henzada	603	180	106	74	
Akyab	1,208	375	364	113	
Total ...	10,269	1,761	5,010	752	

G.—*Condition of the permanent Survey-marks.*

District.	Total number of permanent survey-marks in the district.	Number of marks visited by thugyis and taiksayes.	Number of marks		Number of marks		Remarks.
			Found broken.	Replaced.	Missing.	Replaced.	
Pegu	12,122	6,858	1,392	1,256	3,070	2,509	1888-89.
		6,380	810	780	1,509	1,299	1889-90.
Hanthawaddy ...	10,778	8,016	418	1,873	1,950	871	1888-89.
		4,355	795	795	453	353	1889-90.
Tharrawaddy ...	9,090	8,130	2,814	2,814	2,166	1,505	1888-89.
		7,829	1,106	349	1,114	158	1889-90.
Prome	7,552	5,706	1,802	305	2,501	1,258	1888-89.
		2,433	718	408	784	651	1889-90.
Bassein	19,211	1,109	442	442	659	602	1888-89.
		9,879	1,115	1,115	2,173	2,173	1889-90.
Henzada ...	17,875*	12,966	2,429	1,699	3,688	1,595	1888-89.
		14,013	2,069	1,900	3,572	2,285	1889-90.
Akyab	11,106	4,610	98	5	1,463	565	1888-89.
		3,907	163	163	503	358	1889-90.
Total ...	...	47,395	9,395	8,394	15,497	8,905	1888-89.
		48,796	6,776	5,510	10,108	7,277	1889-90.

* Revised figures.

H.—*Thugyis' Commission and Thugyis' Assistants' Salaries.*

District.	Number of thugyis.	Year.	Total area assessed or held under temporary exemption.	Thugyis' commission			Deductions made from thugyis' commission				Balance paid to thugyis.	Remarks.
				On land revenue.	On capitation-tax and other taxes or rates.	Total.	*For thugyisayes.*		Chainmen.	Total.		
							Number.	Amount per annum.				
			Acres.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	
Pegu	37	1888-89 ...	713,947	67,072	23,283	90,355	43	16,052	2,312	18,364	71,991	
	37	1889-90 ...	754,873	83,949	24,501	1,08,450	49	17,773	2,774	20,547	87,903	
Hanthawaddy	34	1888-89 ...	468,482	54,797	20,880	75,677	33	12,192	...	12,192	63,485	
	34	1889-90 ...	476,269	57,055	22,433	79,488	38	13,045	...	13,045	66,443	
Tharrawaddy	25	1888-89 ...	319,601	29,881	19,016	48,897	37	10,740	...	10,740	38,157	
	25	1889-90 ...	326,254	32,075	18,905	50,980	40	12,598	4,671	17,269	33,711	
Prome	39	1888-89 ...	229,061	16,207	20,547	36,754	27	10,680	2,066	12,746	24,008	
	36	1889-90 ...	232,293	15,197	21,360	36,557	26	10,308	2,663	12,971	23,586	
Bassein	34	1888-89 ...	501,463	45,829	23,976	69,805	50	31,013	...	31,013	38,792	
	34	1889-90 ...	531,030	49,554	25,136	74,690	51	33,660	...	33,660	41,030	
Henzada	38	1888-89 ...	325,743	28,835	25,915	54,750	30	9,363	2,016	11,379	43,371	
	37	1889-90 ...	335,070	31,113	28,736	59,849	31	11,674	2,045	13,719	46,130	
Akyab	80	1888-89 ...	366,235	51,307	24,921	76,228	46	14,241	3,575	17,816	58,412	
	77	1889-90 ...	459,627	57,790	29,752	87,542	52	21,681	2,805	24,486	63,056	
Total ...	287	1888-89 ...	2,924,532	2,93,928	1,58,538	4,52,466	266	1,04,281	9,969	1,14,250	3,38,216	
	280	1889-90 ...	3,115,416	3,26,733	1,70,823	4,97,556	287	1,20,739	14,958	1,35,697	3,61,859	

I.—*Survey Examinations in Lower Burma.*

District.	Number of candidates who passed in				Remarks.
	October 1889.		*April 1890.*		
	From Government survey schools.	From other schools or private students.	From Government survey schools.	From other schools or private students.	
1	2	3	4	5	6
Akyab ...	9	4	8	4	
Kyaukpyu ...	3	1	7	...	
Sandoway ...	...	...	...	...	
Hanthawaddy including Rangoon.	3	2	9	2	
Pegu ...	11	2	14	7	
Prome ...	14	4	10	3*	* Including one from Thayetmyo.
Tharrawaddy ...	...	...	...	1	
Henzada ...	1	1	5	2	
Bassein ...	5	2	3	4	
Thôngwa ...	...	1	...	2	
Moulmein and Amherst	3	1	10	...	
Toungoo ...	6	1	5	...	
Shwegyin ...	2	1	...	4†	† Municipal school.
Total ...	60	20	71	29	

Total number of Candidates passed.

June 1887	29
October 1887	26
June 1888	96
October 1888	101
June 1889	122
October 1889	90
April 1890	100

c

APPENDIX J.

PEGU DISTRICT.

Statement giving an estimate of the number of Kwins which it will be necessary to re-survey at the end of the term of settlement, as called for in the Director of Land Records and Agriculture's Revenue Department No. 190-36R., dated the 13th January 1890.

Name of circle.	Number of kwins in tract under supplementary survey.	Number of sheets on 16-inch scale.	Area of circle in square miles.	Land which it will not be necessary to re-survey at the end of the term of settlement.				Land which it will be necessary to re-survey at the end of the term of settlement.				Remarks and reasons for re-survey.
				Number of kwins.		Number of sheets not requiring survey.	Area of land not requiring survey.	Number of kwins.		Number of sheets to be re-surveyed.	Area of land to be re-surveyed.	
				No survey required.	No survey required in some sheets.			Re-survey necessary throughout.	Re-survey necessary in some sheets only.			
1	2	3	4	5	6	7	8	9	10	11	12	13
							Sq. m.				Sq. m.	
Payagale ...	54	156	119	37	7	117	98	10	7	39	21	Extensions.
Meyinzaya ...	47	97	70	40	5	87	67	2	5	10	3	Changes.
Zaingganaing ...	30	76	61	26	1	70	57	3	1	6	4	Extensions in jungle.
Lagunbyin ...	45	88	63	44	...	85	61	1	...	3	2	
Zalètaw ...	35	83	66	29	3	71	62	3	3	12	4	Extensions and changes.
Yitkangyi ...	15	62	103	9	3	44	91	3	3	18	12	Extensions.
Kadônbaw ...	7	46	40	1	6	33	33	...	6	13	7	Extensions and and changes.
Kayan ...	8	49	43	3	4	24	39	1	4	25	4	Changes.
Takaw ...	12	59	55	9	1	43	45	2	1	16	10	
Agun ...	12	48	41	10	2	42	37	...	2	6	4	
Alangôn ...	7	42	39	4	3	35	37	...	3	7	2	
Tada ...	17	63	48	15	2	55	46	...	2	8	2	
Megathan ...	25	75	38	22	1	56	33	2	1	19	5	Extensions.
Total ...	314	944	786	249	38	762	706	27	38	182	80	
	The above 12 circles are those in which lands which require re-survey are largest and are difficult to survey for which special arrangements will have to be made. In many other circles there are small areas which are not correct, but steps will be taken to have them corrected.											
Twenty-five other circles not requiring survey.	603	1,725	1,232	603	...	1,725	1,232	...	...	...	...	
GRAND TOTAL...	917	2,669	2,018	852	38	2,487	1,938	27	38	182	80	

APPENDIX J.

HANTHAWADDY DISTRICT.

Statement giving an estimate of the number of Kwins which it will be necessary to re-survey at the end of the term of settlement.

Name of circle.	Number of kwins in tract under supplementary survey.	Number of sheets on 16-inch scale.	Area of circle in square miles.	Land which it will not be necessary to re-survey at the end of the term of settlement.				Land which it will be necessary to re-survey at the end of the term of settlement.				Remarks.
				Number of kwins.		Number of sheets not requiring re-survey.	Area of land not requiring re-survey.	Number of kwins.		Number of sheets to be re-surveyed.	Area of land to be re-surveyed.	
				No survey required.	No survey required in some sheets.			Re-survey necessary throughout.	Re-survey necessary in some sheets only.			
1	2	3	4	5	6	7	8	9	10	11	12	13
Mokkyun	30	55	42·71	27	2	50	40·21	1	2	5	2·50	Kwin No. 1 will require an entire new survey. Nos. 4 and 5 a partial re-survey.
Zepathwè	33	67	50·46	28	5	58	48·07	...	5	9	2·39	Kwins Nos. 15, 16, 30, 31, and 49 likely to require partial survey.
Kanyingôn	21	57	46·86	15	4	45	42·86	2	4	12	4·00	Kwins Nos. 14 and 48 will require to be entirely re-surveyed, and Nos. 32 and 33 a partial re-survey.
Tawku	29	62	47·93	24	5	50	43·43	...	5	12	4·50	Kwins Nos. 15, 19, 23, 25, and 29 will require partial re-survey.
Taunmanaing	18	45	41·74	17	1	43	40·74	...	1	2	1·00	A partial re-survey required in kwin No. 4.
Myogôn	21	46	32·03	17	3	41	29·03	1	3	5	3·00	An entire re-survey required in No. 26 kwin, and partial re-survey in Nos. 8, 24, and 28.
Kamaba	28	58	44·36	25	3	52	40·36	...	3	6	4·00	Partial re-survey required in three kwins, namely, Nos. 11, 19, and 33.
Eindapuya	26	82	67·04	19	6	69	59·54	1	6	13	7·50	An entire re-survey required in kwin No. 24.
Kawhmu	34	120	60·29	34	...	120	60·29	...	...	...	...	
Kodaung	18	35	26·88	17	1	34	26·57	...	1	1	0·31	Kwin No. 27 requires a partial survey.
Danôk	24	43	29·37	23	1	41	28·77	...	1	2	0·60	Kwin No. 36 requires a partial survey.
Pyawbwè	23	39	30·89	23	...	39	30·89	...	...	...	...	
Kanaungto	16	31	17·86	16	...	31	17·86	...	...	...	...	
Tamatakaw	20	32	19·38	20	...	32	19·38	...	...	...	...	
Kanbè	27	53	37·13	24	2	50	35·13	1	2	3	2·00	Kwin No. 20 will require an entire re-survey, and Nos. 5 and 6 partial re-survey.

Statement giving an estimate of the number of Kwins which it will be necessary to re-survey at the end of the term of settlement—concluded.

Name of circle.	Number of kwins in tract under supplementary survey.	Number of sheets on 16-inch scale.	Area of circle in square miles.	Lands which it will not be necessary to re-survey at the end of the term of settlement.				Land which it will be necessary to re-survey at the end of the term of settlement.				Remarks.
				Number of kwins.		Number of sheets not requiring re-survey.	Area of land not requiring re-survey.	Number of kwins.		Number of sheets to be re-surveyed.	Area of land to be re-surveyed.	
				No survey required.	No survey required in some sheets.			Re-survey necessary throughout.	Re-survey necessary in some sheets only.			
1	2	3	4	5	6	7	8	9	10	11	12	13
Tunte	38	72	52·96	35	...	66	50·46	3	...	6	2·50	Kwins Nos. 11, 25, and 26 will require entirely re-surveying.
Kanywa	15	46	36·09	15	...	46	36·09	...	...	...	...	
Mahlaing	19	34	23·64	18	1	33	23·44	...	1	1	0·20	No. 32, an island kwin, also two sandbanks in the Panhlaing kwin.
Panhlaing	43	133	114·37	39	4	125	108·22	...	4	8	6·15	Kwins Nos. 4, 26, 30, and 38 will require partial re-survey.
Kyun-u	39	60	42·71	20	7	27	24·21	12	7	33	18·50	Kwins Nos. 18, 20, 21, 25, 28, 29, 30, 35, 36, 37, 38, and 39 will require entirely re-surveying. Nos. 16 17, 26, 27, 31, and 33 a partial re-survey.
Padan	15	30	21·24	5	...	30	21·24	...	...	...	...	
Kazin	21	38	25·46	21	...	38	25·46	...	...	...	...	*Note.*—Large areas of new lands are being taken up in Kyun-u and Tantabin circles.
Tantabin	29	52	41·25	16	6	24	18·50	7	6	28	22·75	Kwins Nos. 1, 15, 16, 17, 18, 19, and 24 will require re-surveying, and Nos. 2, 10, 14, 20, 25, and 28 a partial re-survey.
Leingôn	23	47	33·37	17	4	37	24·37	2	4	10	9·00	Kwins Nos. 16 and 19 require entire new surveys. Nos. 4, 17, 20, and 21 partial re-survey.
Hmawbi	40	81	56·46	31	5	66	49·46	4	5	15	7·00	Kwins Nos. 1, 2, 3, and 26 will require re-survey, and in Nos. 17, 27, 35, and 36 only partial re-survey.
Kyaunggôn	30	56	42·24	29	1	52	39·24	...	1	4	3·00	Kwin No. 19 will require a partial re-survey.
Mingaladôn	25	35	24·83	20	5	26	17·33	...	5	9	7·50	Kwins Nos. 7, 8, 9, 10, 12, and 13 will require partial re-survey.
Kôndan	22	41	30·61	20	2	37	28·61	...	2	4	2·00	Kwins Nos. 10 and 4 will require partial re-survey.
Kyaukchaung	22	35	25·16	22	...	35	25·16	...	...	...	...	
Sitpin	29	46	33·68	29	...	46	33·68	...	...	...	...	
Bala	19	43	35·01	19	...	43	35·01	...	...	...	...	
Yetho	30	69	52·43	30	...	69	52·43	...	...	...	...	
Ôkkan	25	56	38·15	20	5	41	25·15	...	5	15	13·00	Partial re-survey required in kwins Nos. 1, 20, 31, 36 and 37.
Tabumyo	63	131	88·49	54	7	111	70·49	2	7	20	18·00	Partial re-survey required in Nos. 25, 26, 46, 47, 48, 49, and 50. An entire new survey in Nos. 55 and 58.
Total ...	915*	1,930	1,413·08	789	80	1,707	1,271·68	36	80	223	141·40	

* Includes 2 waste land kwins.

THARRAWADDY DISTRICT.

Statement giving an estimate of the number of Kwins which it will be necessary to survey at the end of the term of settlement.

Name of circle.	Number of kwins in tract under supplementary survey.	Number of sheets on 16-inch scale.	Area of circles in square miles.	Lands which it will not be necessary to survey at the end of the term of settlement.				Lands which it will be necessary to re-survey at the end of the term of settlement.				Remarks.
				Number of kwins.		Number of sheets not requiring re-survey.	Area of land not requiring re-survey.	Number of kwins.		Number of sheets to be re-surveyed.	Area of land to be re-surveyed.	
				No survey required.	No survey required in some sheets.			Re-survey necessary throughout.	Re-survey necessary in some sheets only.			
1	2	3	4	5	6	7	8	9	10	11	12	13
							Sq. m.				Sq. m.	
Tayôkmyaw ...	24	56	52	22	1	53	50	1	1	3	2	
Indaingbu ...	15	38	35	13	2	35	32	...	2	3	3	
Tapun ...	10	27	26	10	...	27	26	...	...	...	...	
Ledaw ...	17	34	28	17	...	34	28	...	...	...	...	
Kubyu ...	26	62	53	24	...	58	50	2	...	4	3	
Taungnyo ...	4	20	23	3	1	19	22	...	1	1	1	
Total ...	96	237	217	89	4	226	208	3	4	11	9	
Sainggwet ...	15	52	50	12	3	48	45	...	3	4	5	
Zigôn ...	13	37	30	13	...	37	31	...	...	...	...	
Moza ...	16	43	34	16	...	43	34	...	...	...	...	
Lemyethna ...	13	32	25	12	...	29	23	1	...	3	2	
Kunitywa ...	12	25	21	12	...	25	21	...	...	...	...	
Shabinda ...	6	18	17	5	1	17	15	...	1	1	1	
Yindaikpin ...	10	38	34	8	2	36	32	...	2	2	2	
Myodwin ...	23	69	57	21	2	65	53	...	2	4	4	
Total ...	108	314	268	99	8	300	254	1	8	14	14	
Mataungda ...	9	27	20	8	1	25	19	...	1	2	1	
Kyettaik ...	36	112	98	32	4	104	90	...	4	8	8	
Sèhnaywa ...	38	96	74	33	5	86	65	...	5	10	9	
Minhla ...	17	59	46	17	...	59	46	...	...	...	...	
Lwinbyin ...	3	6	4	3	...	6	4	...	...	...	...	
Pauktaw ...	34	57	38	24	...	57	38	...	...	...	...	
Total ...	127	357	280	117	10	337	262	...	10	20	18	
Tônbula ...	29	56	38	27	...	49	32	2	...	7	6	
Kyeni ...	23	97	97	21	2	95	95	...	2	2	2	
Letpadan ...	17	41	30	11	5	31	23	1	5	10	7	
Saduthiyi ...	19	105	94	12	7	86	72	1	7	19	21	
Thônzè ...	32	92	88	27	3	71	64	2	3	21	25	
Total ...	120	391	347	98	17	332	286	6	17	59	61	
GRAND TOTAL ...	451*	1,299	1,112	403	39	1,195	1,010	10	39	104	102	

* Includes 2 waste land kwins.

PROME DISTRICT.

Statement giving an estimate of the number of Kwins which it will be necessary to re-survey at the end of the term of settlement.

Name of circle.	Number of kwins in tract under supplementary survey.	Number of sheets on 16-inch scale.	Area of circle in square miles.	Lands which it will not be necessary to re-survey at the end of the term of settlement.				Lands which it will be necessary to re-survey at the end of the term of settlement.				Remarks.
				Number of kwins.		Number of sheets not requiring re-survey.	Area of land not requiring re-survey.	Number of kwins.		Number of sheets to be re-surveyed.	Area of land to be re-surveyed.	
				No survey required.	No survey required in some sheets.			Re-survey necessary throughout.	Re-survey necessary in some sheets only.			
1	2	3	4	5	6	7	8	9	10	11	12	13
Kyungôn	12	24	18·49	12	...	24	18·49	...	...	...	...	
Kôkkobin	11	19	17·27	11	...	19	17·27	...	...	...	...	
Thapancho	10	24	18·17	10	...	24	18·17	...	...	...	...	
Bwêbingan	10	16	12·05	10	...	16	12·05	...	...	...	...	
Zibinhla	11	38	38·24	9	1	30	29·03	1	1	8	9·21	Waste at the time of original survey.
Kyundawhla	5	8	5·82	5	...	8	5·82	...	...	...	...	
Magyibin	6	14	11·31	6	...	14	11·31	...	...	...	...	
Total ...	65	143	121·35	63	1	135	112·14	1	1	8	9·21	
Inmangè	9	33	33·18	9	...	33	33·18	...	...	...	...	
Daungbôn	18	39	29·53	18	...	39	29·53	...	...	...	...	
Kalathinka	17	47	42·06	15	...	43	40·70	2	...	4	1·36	Waste at the time of original survey.
Sabègan	9	25	21·98	9	...	25	21·98	...	...	...	...	
Kayagôn	14	34	34·20	14	...	34	34·20	...	..	...	...	
Thabyepaunggyi	13	26	18·63	13	...	26	18·63	...	...	...	...	
Total ...	80	204	179·58	78	...	200	178·22	2	...	4	1·36	
Namayan	4	4	3·69	4	...	4	3·69	...	...	...	...	
Pyaukseik	5	8	4·31	5	...	8	4·31	...	...	...	...	
Minywa	7	11	9·18	7	...	11	9·18	...	...	...	...	
Kyithè	19	35	29·75	18	...	32	28·30	1	...	3	1·45	Kaing cultivation changes annually.
Udein	6	15	10·78	6	...	15	10·78	...	...	...	...	

Paunggyôk	9	21	19·83	5	4	10	16·10	...	4	11	3·73	Waste at the time of original survey, and also surveyed wrong by cadastral survey.
Tawhaing	15	33	25·00	15	...	33	25·00	...	...	...	...	
Nyaungzaye	10	40	42·42	6	1	24	23·63	3	1	16	18·79	Kaing cultivation changes annually.
Total ...	75	167	144·96	66	5	137	120·99	4	5	30	23·97	
Pôkgolyaung												
Magyigyo												
Yathe												
Zalodin												
Tanbauk	6	10	9·09	6	...	10	9·09	...	...	...	...	
Sèhnaywa	15	27	20·76	15	...	27	20·76	...	...	...	...	
Wettigan	14	25	21·22	14	...	25	21·22	...	...	...	...	
Ywathit	5	6	4·76	5	...	6	4·76	...	...	...	...	
Alodawya	6	11	7·10	6	...	11	7·10	...	...	...	...	
Migyaungyè	11	24	16·00	11	...	24	16·00	...	...	...	...	
Menimabye	20	45	33·77	12	2	36	25·58	6	...	9	8·19	Waste at the time of original survey, and surveyed wrong by cadastral survey.
Sinmizwè	17	43	36·27	16	...	36	24·61	1	2	7	11·66	
Pyinma-aing	18	72	70·30	14	1	45	32·75	3	1	27	37·55	
Gawdamaw	4	10	7·61	4	...	10	7·61	...	...	...	...	
Lemego	9	13	10·33	9	...	13	10·33	...	...	...	...	
	5	8	6·01	5	...	8	6·01	...	...	...	...	
	2	3	1·89	2	...	3	1·89	...	...	...	...	
Total ...	9	10	5·66	9	...	10	5·66	...	...	...	...	
	4	7	4·01	4	...	7	4·01	...	...	...	...	
Paungdè												
Thègôn												
Shwedaung												
Mahathaman	145	314	254·78	132	3	271	197·38	10	3	43	57·40	
	65	143	121·35	63	1	135	112·14	1	1	8	9·21	
	80	204	179·58	78	...	200	178·22	2	...	4	1·36	
	75	167	144·96	66	5	137	120·99	4	5	30	23·97	
	145	314	254·78	132	3	271	197·38	10	3	43	57·40	
GRAND TOTAL ...	365	828	700·67	339	9	743	608·73	17	9	85	91·94	

BASSEIN DISTRICT.

Statement giving an estimate of kwins which it will be necessary to re-survey at the end of the term of settlement.

Name of circle.	Number of kwins in tract under supplementary survey.	Number of sheets on 16-inch scale.	Area of circle in square mile.	Lands which it will not be necessary to survey at the end of the term of settlement.				Lands which it will be necessary to re-survey at the end of the term of settlement.				Remarks.
				Number of kwins.		Number of sheets not requiring survey.	Area of land not requiring re-survey.	Number of kwins.		Number of sheets to be re-surveyed.	Area of land to be re-surveyed.	
				No survey required.	No survey required in some sheets.			Re-survey necessary throughout.	Re-survey necessary in some sheets only.			
1	2	3	4	5	6	7	8	9	10	11	12	13
Ngathainggyaung ...	3	3	1·49	3	...	3	1·49	...	...	...	...	
Yegyi North ...	6	8	6·19	6	...	8	6·19	...	...	...	...	
Yegyi South ...	19	23	15·76	19	...	23	15·76	...	...	...	...	
Thitpyubin ...	21	35	25·84	21	...	35	25·84	...	...	...	...	
Tabingyo ...	10	17	14·26	10	...	17	14·26	...	...	...	...	
Pyinmabinhla ...	18	43	30·59	18	...	43	30·59	...	...	...	...	
Tazinhla ...	24	38	29·98	24	...	38	29·98	...	...	...	...	
Athôk ...	43	105	79·36	35	7	94	72·36	1	7	11	7·00	This area has been entered as entire blocks may be found out of position by a few links.
Taunglôn ...	27	82	31·87	26	...	79	30·34	1	...	3	1·58*	* Area of kwins under plantain gardens.
Kabè ...	14	44	34·26	14	...	44	34·26	...	...	...	...	
Dègôn ...	29	68	52·23	29	...	68	52·23	...	...	...	...	
Kyungyaung ...	26	104	85·72	26	...	104	85·72	...	...	...	...	
Lèzu ...	18	70	62·24	18	...	70	62·24	...	...	...	...	
Kanywa ...	40	105	67·06	40	...	105	67·06	...	...	...	...	
Pebin ...	25	84	77·42	25	...	84	77·42	...	...	...	...	
Kyaukchaunggyi ...	31	70	53·57	31	...	70	53·57	...	...	...	...	
Shwemyindin ...	20	37	28·49	20	...	37	28·49	...	...	...	...	
Zegyaung ...	12	21	14·06	12	...	21	14·06	...	...	...	...	
Athegyi ...	10	23	18·08	10	...	23	18·08	...	...	...	...	
Takaing ...	11	29	21·88	11		29	21·88	...	...	...	...	
Leinggôn ...	21	36	25·02	21		36	25·02	...	...	...	...	
Mèzali ...	31	59	34·01	31	...	53	34·01	...	...	...	...	
Kyônkani ...	21	87	72·30	19	...	73	58·06	2	...	14	14·24†	†The details have been finished, but the relative positions of big blocks of cultivation may be out by a few links. The Superintendent therefore considers it advisable to re-check these.

Thigwin ...	33	123	86·40	28	...	96	64·60	5	...	27	21·80‡	‡ Kazins alter so often that it is thought advisable to have a re-survey.
Mobya North ...	10	69	73·31	6	1	34	38·30	3	1	35	35·01§	§ The kwins in this circle are very large with very few subtraverse lines. Big blocks may therefore be out of position slightly.
Mobya South ...	12	74	52·27	10	2	64	48·01	...	2	10	4·26	
Einmè ...	28	80	54·18	28	...	80	54·18	...	...	...	...	
Tanlebin ...	46	122	85·64	42	...	108	72·24	4	...	14	13·40‡	
Thabyela ...	33	118	100·20	26	...	80	65·70	7	...	38	34·50‖	‖ Plantain gardens.
Inyè ...	30	73	59·59	27	...	60	50·52	3	...	13	9·07‖	
Kyaunggôn ...	29	137	113·92	26	...	108	97·55	3	...	29	16·37¶	¶ Extensions without a sufficient number of subtraverse stations to base the work on.
Sabèyôn ...	22	91	80·54	18	...	70	61·09	4	...	21	19·45¶	
Thaung ...	25	82	78·24	14	...	33	30·43	11	...	49	47·81‖	
Kyônkazin ...	25	96	87·90	13	7	32	50·92	5	7	64	36·98**	**Plantain gardens and no theodolite stations to base the work on.
Shwenyaungbin ...	25	65	50·49	25	...	65	50·49	...	...	...	...	
Kindat ...	35	61	36·33	35	...	61	36·33	...	...	...	...	
Daga ...	15	23	13·07	15	...	23	13·07	...	...	...	...	
Thabaung ...	18	28	19·37	18	...	28	19·37	...	...	...	...	
Kwinhla ...	71	78	39·36	71	...	78	39·36	...	...	...	...	
Ngakwa ...	24	31	17·57	24	...	31	17·57	...	...	...	...	
Shangwin ...	17	24	10·51	17	...	24	10·51	...	...	...	...	
Thanyetsun ...	29	37	21·78	29	...	37	21·78	...	...	...	...	
Zibyugwin ...	15	21	11·06	15	...	21	11·06	...	...	...	...	
Saingpyun ...	15	15	7·50	15	...	15	7·50	...	...	...	...	
Lemyethna North ...	16	23	1 ·30	16	...	23	14·30	...	...	...	...	
Lemyethna South ...	6	18	17·13	6	...	18	17·13	...	...	...	...	
Kanyindaing ...	19	26	14·11	19	...	26	14·11	...	...	...	...	
Kyauksè ...	15	38	26·81	15	...	38	26·81	...	...	...	...	
Konbyin ...	23	42	27·69	23	...	42	27·69	...	...	...	...	
Thaungdan ...	29	40	21·09	29	...	40	21·09	...	...	...	...	
Padawkanni ...	18	52	41·58	18	...	52	41·58	...	...	...	...	
Kwingyaung ...	9	16	11·17	9	...	16	11·17	...	...	...	...	
Daunggyi ...	12	29	23·45	12	...	29	23·45	...	...	...	...	
Bôkchaung ...	26	69	56·22	22	...	59	49·66	4	...	10	6·56	
Myenu ...	35	77	63·70	28	...	48	39·51	7	...	29	24·19††	†† Plantain gardens and extensions to the north.
Total ...	1,245*	3,063	2,298·16	1,168	17	2,696	2,005·99	60	17	367	292·17	

* Includes 4 waste land kwins.

Note.—The estimate shows the largest possible area which it may be necessary to revise. After check lines have been run through the cultivated portions in Kyaukazin, Athôk, Kyaukani, Kyaungôn, Sabèyan, and Thaung it may be found necessary to reduce these areas.

HENZADA DISTRICT.

Statement giving an estimate of the number of kwins which it will be necessary to re-survey at the end of the term of settlement.

Name of circle.	Number of kwins in the tract under supplementary survey.	Number of sheets on 16-inch scale.	Area of circles in square miles.	Lands which it will not be necessary to re-survey at the end of the term of settlement.				Lands which it will be necessary to re-survey at the end of the term of settlement.				Remarks.
				Number of kwins.		Number of sheets not requiring survey.	Area of land not requiring survey.	Number of kwins.		Number of sheets to be re-surveyed.	Area of land to be re-surveyed.	
				No survey required.	No survey required in some sheets.			Re-survey necessary throughout.	Re-survey necessary in some sheets only.			
1	2	3	4	5	6	7	8	9	10	11	12	13
Taulebin	20	74	68·47	13	5	47	42·61	2	5	27	25·86	
Thanèthabauk	26	79	52·41	26	...	79	52·41	...	...	...	...	
Tòntarôk	14	42	30·50	11	...	35	29·54	3	...	7	4·96	
Nyaungbintha	11	25	18·36	8	...	17	11·62	3	...	8	6·74	
Zalun myoma	7	12	9·64	7	...	12	9·64	...	...	...	...	
Taungbotaya	12	31	32·26	10	...	16	14·86	2	...	15	17·40	
Apyauk	9	23	18·01	8	...	16	12·29	1	...	7	5·72	
Duya	16	39	29·33	16	...	39	29·33	...	...	...	...	
Anaukpet	11	14	9·15	11	...	14	9·15	...	...	...	...	
Lèdikanhla	9	22	16·61	9	...	22	16·61	...	...	...	...	
Thaununthanaw	5	8	6·29	5	...	8	6·29	...	...	...	...	
Natmaw	19	41	30·44	19	...	41	30·44	...	...	...	...	
Kyonpa	8	15	14·01	8	...	15	14·01	...	...	...	...	
Gyaungkwi	12	24	20·76	12	...	24	20·76	...	...	...	...	

Hlèzeik	23	55	40·22	20	...	46	32·67	3	...	9	7·55
Danbi	19	55	49·79	19	...	55	49·79	...	...	...	...
Kabaing	13	56	57·43	10	3	45	48·95	...	3	11	8·48
Henzada myoma	1	3	3·18	1	...	3	3·18	...	...	...	...
Chaukywa	11	51	50·79	11	...	51	50·79	...	...	...	...
Kwingauk South	12	42	40·07	12	...	42	40·07	...	...	...	...
Kwingauk North	23	70	59·46	23	...	70	59·46	...	...	...	...
Sebin	14	31	23·48	14	...	31	23·48	...	...	...	...
Ôkpo myoma	13	42	33·91	13	...	42	33·91	...	...	...	...
Thetngèbin	18	98	96·91	15	3	92	92·47	...	3	6	4·44
Nyaungywagyi	18	43	35·90	17	1	39	31·21	...	1	4	4·69
Shwegyin	14	69	66·29	11	...	60	58·90	3	...	9	7·39
Obo	15	57	50·87	12	3	49	43·23	...	3	8	7·64
Ywedaung	13	80	73·75	9	4	62	57·47	...	4	18	16·28
Kanaung myoma	7	17	13·49	7	...	17	13·49	...	...	...	...
Tanthônbin	8	20	17·62	8	...	20	17·62	...	...	...	...
Kundaw	9	20	14·53	9	...	20	14·53	...	...	...	...
Padaw	12	31	24·42	12	...	31	24·42	...	...	...	...
Kyauktan	18	29	17·56	18	...	29	17·56	...	...	...	...
Myanaung myoma	6	17	11·51	6	...	17	11·51	...	...	...	...
Ywathit	9	21	15·80	9	...	21	15·80	...	...	...	...
Kyangin myoma	6	9	5·94	6	...	9	5·94	...	...	...	...
Sônlè	7	30	31·22	7	...	30	31·22	...	...	...	...
Total ...	468	1,395	1,193·38	432	19	1,266	1,077·23	17	19	129	117·15

Akyab District.

Statement giving an estimate of the number of Kwins which it will be necessary to re-survey at the end of the term of settlement.

Circle.	Number of kwins in tract under supplementary survey.	Number of sheets on 16-inch scale.	Area of circle in square miles.	Lands which it will not be necessary to re-survey at the end of the term of settlement.				Lands which it will be necessary to re-survey at the end of the term of settlement.				Remarks.
				Number of kwins.				Number of kwins.				
				No survey required.	No survey required in some sheets.	Number of sheets not requiring re-survey.	Area of land not requiring re-survey.	Re-survey necessary throughout.	Re-survey necessary in some sheets.	Number of sheets to be re-surveyed.	Area of land to be re-surveyed.	
1	2	3	4	5	6	7	8	9	10	11	12	13
Anbari ...	16	47	34·23	18	...	47	34·23	...	...	...	...	
Satyogya ...	14	27	17·77	14	...	27	17·77	...	...	...	...	
Kyawshin ...	10	19	9·88	10	...	19	9·88	...	...	...	...	
Taungnyo ...	20	36	25·23	18	...	33	24·29	...	2	3	·94	
Thayet ...	10	20	13·16	10	...	20	13·16	...	...	...	...	
Sindôk ...	20	44	31·72	20	...	44	31·72	...	...	...	...	
Thalè ...	25	47	33·34	23	...	44	33·08	3	...	3	·26	
Pyagyun ...	39	55	36·22	36	...	51	35·97	1	2	4	·29	
Taungchyung ...	13	23	16·29	13	...	23	16·29	...	...	...	...	
Peinnachyung ...	9	19	11·85	9	...	19	11·85	...	...	...	...	
Khamaungchyung ...	7	14	8·69	7	...	14	8·69	...	...	...	...	
Myaukpyin ...	7	20	14·73	7	...	20	14·73	...	...	...	...	
Sinbaik ...	25	69	44·01	20	...	61	41·95	1	4	·8	2·06	
Pyizogri ...	22	45	27·73	22	...	45	27·73	...	...	...	...	
Kanbyin ...	3	7	6·01	3	...	7	6·01	...	...	...	...	
Kyein ...	14	45	32·04	13	...	43	31·65	...	1	2	·39	
Kaunglaung ...	12	31	19·18	12	...	31	19·18	...	...	...	...	
Tawdan ...	14	54	44·55	14	...	54	44·55	...	...	...	...	
Kanpyo ...	3	10	7·30	3	...	10	7·30	...	...	...	...	
Kaniegywè ...	18	51	30·55	15	...	47	30·02	...	3	4	·53	
Taungbet ...	5	19	11·20	5	...	19	11·20	...	...	...	...	
Letpandaing ...	13	28	23·23	12	...	27	22·84	...	1	1	·39	
Ngasayaing ...	1	1	·52	1	...	1	·52	...	...	...	...	
Yanwa ...	4	22	24·64	4	...	22	24·64	...	...	...	...	
Kadawa ...	7	40	27·71	7	...	40	27·71	...	...	...	...	
Launggyet ...	20	57	43·30	16	...	51	42·88	...	4	6	·42	
Kolosôn ...	7	26	19·07	2	...	16	17·43	...	5	10	1·64	
Chaungpela ...	17	50	33·70	13	...	40	31·91	1	3	10	1·79	
Padaw ...	16	37	33·73	13	...	34	33·28	1	2	3	·45	
Yanchaung ...	6	36	27·68	6	...	36	27·68	...	...	...	...	
Shingyaw ...	6	38	27·25	6	...	38	27·25	...	...	...	...	
Myohaung ...	16	61	45·00	16	...	61	45·00	...	...	...	...	
Pobinyin ...	2	10	6·85	...	...	7	6·23	...	2	3	·62	
Phogywe ...	7	18	12·66	5	...	14	12·22	...	2	4	·44	
Sinbyu ...	11	36	30·57	11	...	36	30·57	...	...	...	...	
Thinganet ...	7	17	11·42	7	...	17	11·42	...	...	...	...	
Kyauktaw ...	10	33	23·31	10	...	33	23·31	...	...	...	...	
Taung Htaung ...	2	5	4·20	2	...	5	4·20	...	...	...	...	
Thau Htaung ...	11	21	15·92	11	...	21	15·92	...	...	...	...	
Myauktaung ...	2	9	8·42	2	...	9	8·42	...	...	...	...	
Yala-ashe ...	15	51	44·34	12	...	46	43·52	...	3	5	·82	
Sin O ...	6	12	8·29	6	...	12	8·29	...	...	...	...	
Pweda ...	6	16	10·46	6	...	16	10·46	...	...	...	...	
Ôkkyut ...	11	38	26·71	10	...	37	26·40	...	1	1	·31	
Tawgan ...	6	16	11·07	6	...	16	11·07	...	...	...	...	
Metkalagyi ...	14	28	16·15	14	...	28	16·15	...	...	...	...	
Sabata ...	11	23	18·75	11	...	23	18·75	...	...	...	...	
Thinbôndan ...	5	13	9·06	5	...	13	9·06	...	...	...	...	
Pansanwe ...	8	14	8·21	8	...	14	8·21	...	...	...	...	
Uritaung ...	21	43	27·42	21	...	43	27·42	...	...	...	...	
Thamihla ...	12	33	19·13	12	...	33	19·13	...	...	...	...	

Statement giving an estimate of the number of Kwins which it will be necessary to re-survey at the end of the term of settlement—concluded.

Circle.	Number of kwins in tract under supplementary survey.	Number of sheets on 16-inch scale.	Area of circle in square miles.	Lands which it will not be necessary to re-survey at the end of the term of settlement. Number of kwins. No survey required.	No survey required in some sheets.	Number of sheets not requiring re-survey.	Area of land not requiring re-survey.	Lands which it will be necessary to re-survey at the end of the term of settlement. Number of kwins. Re-survey necessary throughout.	Re-survey necessary in some sheets.	Number of sheets to be re-surveyed.	Area of land to be re-surveyed.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13
Yotarôk ...	6	17	9·96	6	...	17	9·96	...	...	...	...	
Aungzeik ...	8	23	13·91	8	...	23	13·91	...	...	...	...	
Yingyun ...	10	28	18·10	9	...	27	17·87	...	1	1	·23	
Yogyun ...	14	32	18·58	14	...	32	18·58	...	...	...	...	
Sindien ...	13	27	14·20	13	...	27	14·20	...	...	...	...	
Kundaung ...	14	31	17·44	14	...	31	17·44	...	...	...	...	
Augumiw ...	21	32	23·22	19	...	29	22·91	...	2	3	·31	
Minyodaung ...	7	17	10·77	7	...	17	10·77	...	...	...	...	
Kyunbaw ...	14	30	19·90	14	...	30	19·90	...	...	...	...	
Kyaungdaung ...	15	32	23·27	10	...	25	22·65	2	3	7	·62	
Ngwedaung ...	25	46	30·91	25	...	46	30·91	...	...	...	...	
Thegan ...	22	50	40·89	22	...	50	40·89	...	...	...	...	
Thamehlabyin ...	14	35	25·29	12	...	32	24·98	...	2	3	·31	
Tizwe ...	17	46	32·82	17	...	46	32·82	...	...	...	...	
Gwedaukchaung ...	8	14	8·75	8	...	14	8·75	...	...	...	...	
Rathedaung ...	9	23	15·77	9	...	23	15·77	...	...	...	...	
Laungzin ...	15	35	26·18	15	...	35	26·18	...	...	...	...	
Mozemenzeik ...	21	38	23·31	19	...	35	22·84	1	1	3	·47	
Myomubingyi ...	8	15	12·22	6	...	12	11·44	1	1	3	·78	
Moze ...	8	20	15·48	8	...	20	15·48	...	...	...	...	
Myothitchaung ...	13	41	80·50	13	...	41	80·50	...	...	...	...	
Myothit ...	11	27	18·45	11	...	27	18·45	...	...	...	...	
Ywemyodaung ...	23	48	39·91	19	...	44	39·01	1	3	4	·90	
Ngat ...	23	39	31·49	21	...	37	30·95	...	2	2	·54	
Thayekônbaung ...	22	43	35·67	18	...	39	34·89	3	1	4	·78	
Alothangyaw ...	15	34	21·34	13	...	32	20·80	...	2	2	·54	
Kolapanzin ...	40	109	116·12	35	...	104	115·45	1	4	5	·67	
Total ...	1,005	2,466	1,838·90	932	...	2,362	1,821·44	16	57	104	17·46	

REPORT ON THE SURVEY BY LOCAL AGENCY OF STATE AND OTHER LANDS IN UPPER BURMA DURING THE FIELD SEASON 1889-90 BY MR. R. A. GIBSON.

1. *Introduction.*—In accordance with the orders contained in General Circular No. 9 of 1889 of the Land Records and Agricultural Department a party, consisting of two Surveyors and four chainmen, worked in the Mandalay district for a short period, and survey detachments as marginally noted were employed in each of the following districts during the field season :—

1 Inspector. | 4 Surveyors. 16 Chainmen.

Shwebo, of Northern division.
Sagaing and Ye-u, of Central division.
Meiktila, of Eastern division.
Pakôkku and Minbu, of Southern division.

Under subsequent orders a special survey party, comprising three Inspectors, 20 Surveyors, and 116 chainmen, were entertained as their services were required and employed on the demarcation and survey of the Yenanggyaung oil-field, which lies partly in Magwe and partly in Myingyan districts. The completion of this work on an early date being of the utmost importance the Ye-u detachment was transferred in March 1890 and added on to the strength of this survey and the whole party ordered to continue field work during the present rainy weather.

2. *Supervision of work.*—The work was supervised by Mr. R. A. Gibson, Extra Assistant Commissioner, in addition to his duties in Mandalay as Superintendent, Town and Taungbyôn Supplementary Surveys, and under the immediate orders of the Director of the Department of Land Records and Agriculture, Burma. It was arranged that Mr. Gibson should take the field in November and divide his inspection thus—

In every two months { Two weeks Mandalay surveys and one week, with each of the surveys of Ye-u, Shwebo, Sagaing, Meiktila, Pakôkku, and Minbu.

In the eight months of the field season he would therefore have visited each district four times. This plan, however, could not be carried out owing to his having to devote a great deal of his time to the oil-field survey, which was added to the list of surveys in February 1890. Mr. Gibson checked the work in the different districts in the following order :—

Division.	District.	Number of maps examined *in situ*.	When survey inspected.	Number of times inspected.	Test lines run in chains.	Remarks.
Northern ...	Mandalay ...	25	1st November 1889 ... 23rd December 1889 ... 11th January 1890 ... 4th February 1890 ... 13th March 1890 ... 5th June 1890 ... 8th July 1890 ...	7	115	Besides town survey and assessment.
	Shwebo ...	17	16th November 1889 ... 27th November 1889 ... 24th January 1890 ...	3	704	Also examined registers and dimensions of holdings, &c.
Central ...	Sagaing ...	14	4th December 1889 ... 29th May 1890 ...	2	620	
	Ye-u	4	22nd November 1889... 30th January 1890 ...	2	80	
Eastern ...	Meiktila ...	10	4th January 1890 ... 2nd July 1890 ...	2	150	
Southern ...	Pakôkku ...	16	11th December 1889 ... 24th May 1890 ...	2	145	
	Minbu	18	18th December 1889 ... 19th May 1890 ... 24th July 1890 ...	3	155	
	Magwe (oil-fields) ...	57	19th February 1890 ... 6th April 1890 ... 13th July 1890 ... 5th August 1890 ...	4	*	* Examined *in situ* by interpolation.

3. *Field season.*—The different detachments reached their respective destinations on or about the 1st November 1889 and the field work was started and closed on the dates given below :—

Detachment.	Fields work.	
	Started.	Closed.
Mandalay	6th November 1889 ...	10th February 1890.
Shwebo	4th November 1889 ...	30th June 1890.
Sagaing	1st November 1889 ...	30th June 1890.
Ye-u	7th November 1889 ...	23rd February 1890.
Meiktila	1st November 1889 ...	31st August 1890.
Pakôkku	1st November 1889 ...	22nd June 1890.
Minbu	12th November 1889 ...	31st July 1890.
Magwe (Yenanggyaung oil-fields)	1st March 1889.	Field work carried on during rains.

4. *Description of land surveyed.*—Garden lands in Mandalay district known as "Sa Mye." In Shwebo, Ye-u, Sagaing, and Meiktila State paddy-lands and those claimed as *bobabaing*, which pay irrigation-tax to Government. In Pakôkku and Minbu districts rich alluvial formations partly claimed as private property. In Magwe district the oil-bearing tracts of the Yenanggyaung subdivision comprising hills and plateaus with deep ravines as pointed out and demarcated by Dr. Fritz Noetling, Paleontologist, Geological Survey of India.

5. *Nature of work and the scale adopted.*—In Ye-u the scale of survey was 2″, 4″, and 16″ to a mile. In the other districts 16″=1 mile was everywhere adopted. Boundaries of villages (kwins) were first demarcated by the Surveyors with substantial wooden posts and the lands then mapped with the plane-table. As a rule the boundary marks were used as survey stations and all conspicuous trees, pagodas, pucca wells, &c., carefully fixed for ready reference hereafter in the event of the necessity for Supplementary Survey, and also with the view to the utilization of the work by the Imperial Topographical Department. The oil-field work is based on regular theodolite survey stations and the topographical details of hills are being delineated by means of contours of 10 feet vertical interyals which were approximately obtained by means of the wooden clinometer.

6. *Area surveyed and the increase over the area as shown by local officials.*—The total area surveyed during the field season was 82,535 acres or 128·9 square miles ; of this area 59,970 are under cultivation and 22,565 acres contained non-revenue paying lands, such as waste, village-sites, &c. The table below gives the average increase in area of 178·7 per cent. over the area previously shown by local officials.

Division.	District.	Area under assessment in acres		Increase in area.		Remarks.
		As shown by local officials.	As found by present survey.	Acres.	Per-centage.	
		Acres.	Acres.			
Northern	Mandalay ...	621	1,694*	1,073	172·79	
	Shwebo ...	3,274	15,384	12,110	369·88	
Central	Sagaing ...	3,050	7,725	4,675	153·28	
	Ye-u ...	.....	.....	.....	...	Omitted as the area shown by local officials was not received.
Eastern ...	Meiktila ...	3,814	8,671	4,857	127·35	
Southern	Pakôkku ...	5,097	11,773	6,676	130·98	
	Minbu ...	5,236	13,542	8,306	158·64	
	Total ...	21,092	58,789*	37,697	178·72	*Exclusive of 1,181 acres in Ye-u.

* Of the 15,384 acres shown as liable to assessment in Shwebo 4,717 acres consist of irrigated private land which has not been paying irrigation rate. If this is excluded the increase amounts to 7,393 acres or 225 per cent. Of the 9,222 acres shown as liable to assessment in Sagaing 1,250 acres consist of lands claimed as private, but not believed to be State land. Of the area shown by local officials in Sagaing (3,050 acres) a portion consists of islands leased for fixed sums. The area of these was estimated by local officials at 1,362 acres, but was found by survey to be 1,659 acres.

The oil-field survey party, whose work is in progress, completed 20,000 acres up to 30th June 1890.

Increase in revenue.—In Sagaing, Pakôkku, Minbu, and Meiktila the areas of completed circles, as obtained by the present survey, were adopted for assessment purposes, and the results so far as now known are given below :—

District.	Assessment.		Increase.		Remarks.
	Past year.	Present year.	Rs.	Per centage.	
	Rs.	Rs.			
Sagaing	.....	.....	.....	...	Mayin lands assessed ; particulars not yet received.
Pakôkku	14,420·3	22,048·2	7,627·9	52·9	For 13 circles.
Minbu	.....	.....	.....	...	Particulars not received.
Meiktila	4,556·8	10,630·5	6,073·7	133·3	For two circles.

In Shwebo most of the lands surveyed being fallow (for want of rain and irrigation) there was no assessment.

7. *Miscellaneous work executed besides survey.*—Each of the detachments prepared registers giving the following particulars regarding each holding :—

(*a*) Number and name of holding.
(*b*) Names of owner and occupant.
(*c*) Residence of occupant.
(*d*) Area obtained by survey, divided into "kaukkyi," "mayin," "kaing," and "ya" lands.
(*e*) Area previously given by local officials.
(*f*) Remarks on claims, disputes, &c.

In Minbu, besides the above, the Surveyors in the course of their work, under orders of the Deputy Commissioner, collected statistics of crops raised, quantity of seed used, produce, and revenue paid by tenants for each field and holding. Assessment-rolls were prepared in the districts named in paragraph 6. The majority of survey maps were inked up while in the field.

8. *Cost of survey per acre.*—The following table gives full particulars of cost* of survey and demarcation per acre in the different districts :—

Division.	District.	Area surveyed.		* Cost.	Average cost per acre.*		Remarks.
		Waste and all other lands.	Cultivated area only.		For whole area.	For cultivated area.	
		Acres.	Acres.	Rs.	Anna.	Anna.	
Northern	Mandalay ...	...	1,694	442·87	...	4·18	Holding-by-holding garden survey.
	Shwebo ...	17,215	15,384	3,974·70	3·69	4·13	Holding-by-holding survey.
Central	Sagaing ...	15,883	7,725	3,867·20	3·90	8·01	Field-to-field survey.
	Ye-u ...	...	...	...	...	...	Miscellaneous survey. Cost was Rs. 1,446.
Eastern ...	Meiktila ...	13,641	8,671	4,216·40	4·95	7·78	Field-to-field survey.
Southern	Pakôkku ...	17,636	11,773	4,194·00	3·80	5·70	Holding-by-holding survey.
	Minbu ...	16,609	13,542	4,116·70	3·97	4·86	Holding-by-holding survey.
	Magwe (oil-field) ...	...	...	...	...	...	Survey in progress.
		80,984	58,789	20,811·87	4·11	5·66	

Besides the above, 1,806 acres of garden-lands in Amarapura, of Mandalay district, were surveyed by the District Surveyor at a cost of 5·4 annas per acre.

* The cost given is for the year, that for the remaining months being approximately estimated.

9. *The average size of holdings and number per square mile.*—The average size of holdings is as follows :—

	Acres.
Mandalay	2·09
Shwebo	5·26
Sagaing	2·20
Ye-u	...
Meiktila	1·32
Pakôkku	3·43
Minbu	1·90
Average for all districts ...	2·47

The number of holdings to a square mile of the cultivated area surveyed is 254.

10. *General remarks on field work executed. I. Mandalay Garden Survey.*—The survey of the Royal gardens of Madaya was done under difficulties. The "Sa mye," or State holdings, surveyed were chiefly detached from one another and some of them measured but 0·20 of an acre. The gardens are full of tall fruit trees with ground always wet and hence teeming with malaria. Two men out of the six employed died of malarial fever during the short time the survey was in hand. On the completion of this work in February 1890 the Surveyors were transferred to the Yenanggyaung oil-field survey.

II. *Shwebo Holding-by-holding Survey.*—The area allotted to the Surveyors contained valuable paddy holdings which were easy for survey. The outturn would have been greater had the occupants of the lands been always on the spot whenever required to demarcate their lots. Owing to defective irrigation many of the people had to earn their living by other means than cultivation and were not therefore always to be found when wanted. One of the party, when encamped in Thalôn village, was burnt out accidently. He not only lost his own property, but all survey instruments and his original field map of 180 acres. The area of land as described locally is by the *tinkyè*, a *ngatinkyè* being taken for a pè, or 1·7718 acres, as five baskets of seed are supposed to be used in an area of 1 pè.

III. *Sagaing Field-to-field Survey.*—A large area of waste and other non-revenue paying lands was surveyed under a misunderstanding of Survey Inspector Maung Lu Gyi. The party suffered very much in health during the first three months and three Surveyors had to be changed. The work of two men, covering an area of 1,100 acres, was found very defective and accordingly rejected. During illness these men, to keep up a good outturn of work, entrusted their chainmen, who were most anxious to learn, to carry on their work with this result. The party surveyed "holding by-holding" at the onset, but owing to the very small size of holdings the system was changed to that of "field-to-field." Survey Inspector Maung Lu Gyi was in January 1890 transferred to Lower Burma at his own request. In parts of Sagaing the area of land is described by the *pyo*, a *pyo-ngayawin* being taken for a pè as 500 bundles of *pyo* or nursery plants are supposed to be used in an area of 1 pè.

IV. *Ye-u Survey.*—From November 1889 to January 1890 the detachment was employed in surveying on the 2-inch and 4-inch scales large blocks by the village (kwin) and certain streams. Orders to change the scale of survey to 16-inch = 1 mile were subsequently issued and the party worked on this scale for a period of one month only as it was transferred to take up other more urgent work.

V. *Meiktila Field-to-field Survey.*—The party fared very badly in health in November and December, and one Surveyor (Maung Pu), died of malarial fever. Compared with other districts the outturn of work here is very small, which is chiefly due to the very small size of holdings met with and some of the irrigated lands being under water in November, December, May, and June.

VI. *Pakôkku Holding-by-holding Survey.*—One of the men appointed, though strongly recommended by those under whom he had served before, was found quite incompetent for the kind of work required of him here. He had to be discharged and his work of 427 acres rejected. The work executed by the other Surveyors was good. The lands surveyed were all alluvial, containing miscellaneous crops. In November and December, when some of the ground was covered with tall millet plantations 6 and 8 feet high, the work was very much retarded and was executed under difficulties. Field work was closed before the end of June owing to the sudden rise of the river. When allotting alluvial formations, as in other districts of Upper Burma, the thugyis adopt a measure known as the "gan," which contains an area of 100 square "tas:" 6·25 "gans" make a pè. An acre therefore is equivalent to 3·5275 "gans."

VII. *Minbu Holding-by-holding Survey.*—The health of the party was remarkably good during the season. The ground surveyed is very similar to that of Pakôkku district. Owing to want of method in the arrangements made by the Survey Inspector Maung Gauk field work was not commenced till the middle of November 1889.

VIII. *Magwe-Yenanggyaung Oil-field Topographical Survey.*—The nature of work required being quite new to the men, Mr. Gibson had to train each Surveyor personally be-

fore work could be started. The men displayed great intelligence in acquiring the knowledge of topographical surveying and made fair progress before they were out two months. As the work had to be based on regular theodolite surveys, and the hilly ground with deep ravines did not permit of theodolite and chain traverses being conducted with accuracy, stations were fixed by means of triangulation, which was started by Mr. Gibson and since carried on by two Upper Burmans. The progress would have been very much better had the work been started in the beginning of the cold weather instead of the end of February, when the hot season was just setting in. Carrying on the work in such a country, which may be designated as the desert of Burma, without the shelter of shady trees from the hot sun of April and May, without water close at hand, and one's camp miles away from the working ground proved most trying.

11. *Recess Work.*—During the recess season ending the 31st October 1890 the men will be employed in checking all area statements, completing the inking up of maps, revising registers, &c., and such other work as the Deputy Commissioners may order.

12. *Preservation of Boundary and Survey Marks.*—In accordance with the orders contained in Financial Commissioner's Circular No. 29 of 1890 steps have been taken to issue notices to thugyis for the preservation of boundary and other marks fixed by the survey detachment.

REPORT ON THE OPERATIONS OF THE LOWER BURMA FIELD-TO-FIELD SURVEY BY LOCAL AGENCY PARTY DURING THE FIELD SEASON OF 1889-90 BY MR. J. C. CLANCEY, SUPERINTENDENT OF LAND RECORDS, ON SPECIAL DUTY.

Preliminary arrangements.

IN October last several of the District Officers were addressed with a view to their providing, if possible, qualified Burman Surveyors for employment in connection with the Lower Burma field-to-field survey by local agency. The fact that vacancies existed was also notified in the papers and applications were invited. Out of over 200 names received selections were duly made in the early part of January, and the men appointed as follows, eight Inspectors, 56 Field Surveyors, and six clerks, draughtsmen, &c. Besides these 424 menials were found work as tindals, messengers, chainmen, &c. Among the Field Surveyors there were eight Hindustanis who had worked on cadastral work in Survey of India Parties in India. The object of introducing a few of this class of men into the establishment was to encourage a spirit of emulation between the Burman Surveyors and the few Hindustanis employed, and thus secure a better outturn of work by the former. The Hindustanis were for this purpose equally divided amongst the Inspectors' squads, but I am sorry to say they did not turn out the successes that had been anticipated. With three exceptions the men proved rather a failure, as several of their sheets had to be re-done; in two cases the kwin maps had to be surveyed three times over. Some of the Burmans, on the other hand, did remarkably well, having turned out a large area and earned a good income. All the abovenamed appointments were made with effect from the 15th January 1890, the date on which it was decided to start field-work.

Taking the field.

2. Three detachments were formed one in charge of Myoôk Maung San Dun, which was to work in the Hanthawaddy, Henzada, and Tharrawaddy districts; a second in charge of Myoôk Maung Pyu Than for the Prome district, and the third under Myoôk Maung Tun for work in the Bassein district. All three of these were fully equipped and ready to start for the field on the 15th January, but on that date the 16-inch traverse maps from only nine kwins had been received from the Deputy Superintendent. The three camps were, however, started off to their respective stations of Taikgyi, Prome, and Myaungmya, Nos. 1 and 3, on the forenoon of the 18th January and No. 2 on the night of the 17th idem.

System of payments to Field Surveyors and others.

3. Inspectors were engaged at fixed monthly salaries of Rs. 40 to Rs. 80. They got in addition a fixed travelling allowance calculated at Rs. 20 each per mensem for the time they were out in the field. Field Surveyors were to be paid at contract rates according to the class of work done, fields or topographical features, and its quality. They received advances on account however of Rs. 20 or less, where considered necessary, per mensem, which sums were to be deducted from their total earnings at the end of the field season. Deserving Field Surveyors were promised work during the recess on fixed salaries as draughtsmen, computers, &c. Messengers and tindals received Rs. 14 per mensem and kalassies Rs. 12 Field Surveyors were directed to find their own chainmen, but as a matter of fact about half the required number had to be engaged for them. The kalassies were men who were taken on locally at Rangoon, Taikgyi, Prome, and elsewhere. Next season it may not be possible to get all the men required in Burma, owing to a larger establishment that will be required for the year's work, so that some arrangement will have to be entered into for getting part of the required number from India by payment of their steamer fares to and from Burma and fixing the pay of such men at a lower rate of Rs. 10 just as is the practice in Survey of India Parties.

Commencement of field work and training of hands.

4. As soon as the Camp Officers arrived at their respective destinations they went over to the traverse camps at their respective centres and obtained from the officers in charge of these such of the plots as were ready. With these field work was immediately started, two and three Surveyors, owing to the smallness of the number of sheets supplied, being put to the same kwin. The Myoôks and Inspectors accompanied their Field Surveyors and did a good deal in teaching them their work as most of the hands were raw to it; for, although a great number possessed the Syndicate certificates of qualification in surveying by the thugyiship standard, they had had no previous experience in a survey party, and were therefore unable at the start to survey as accurately and as well as was desirable. In a fortnight or so, however, all hands were fairly well trained and better results, both in regard to quality as well as to quantity, began to be obtained. In the surveying of hills particularly, which covered rather a large area in Prome, the Surveyors experienced the greatest difficulty. The contour lines were to be marked at 10 feet vertical intervals, but the Surveyors would insist on putting them in by the bare eye instead of from measurement until several of their sheets were rejected and ordered to be re-done, when better work was forthcoming.

Delays in receipt of traverse plots and result thereof.

5. There were serious delays in the receipt of plots from all the traverse camps. Had they come to hand earlier and in larger numbers, it is anticipated that about 25 per cent. more of work would have been surveyed field-to-field during the season.

Some partially surveyed kwins had to be left undone owing to the early breaking of the rains this year and the consequent sudden closing of the field season, while the kwins which were untouched were thus left owing to the plots relating to them having been received at about the conclusion of field work, when there was not the time left to put them in hand.

It may be remarked that the Field-to-field Survey Party was far from being of full strength. The Field Surveyors numbered only about one-half of what are taken on in No. 7 Cadastral Party (Mr. Kelly's), so that it cannot be urged that our camps were abnormally strong. Besides, at the Survey Conference, it was decided that 3,010 square miles of country was to be traversed by No. 12 Party in two years, 1889-90 and 1890-91, or at the rate of about 1,500 square miles per year.

Tracts intended for survey, those surveyed, and those remaining to be surveyed.

6. The areas, in square miles, of these various tracts, for each of the districts are approximately as under—

District.	Excluded area.	Area surveyed.	Area for survey.	Total area.
	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.
Hanthawaddy	...	67·41	333·27	400·68
Henzada	19·80	...	393·60	412·90
Tharrawaddy	24·32	...	136·80	161·12
Prome	439·68	111·05	844·91	1,395·62
Bassein	651·60	105·52	731·28	1,488·40
Total ...	1,134·90	283·96	2,439·86	3,858·72

It may be mentioned that the above areas have been taken out by the planimeter from the ¼-inch index maps supplied by the Superintendents of Land Records, and that they differ very considerably from those adopted in the Survey Conference scheme.

In the Hanthawaddy district Myaungtaga circle alone has been undertaken this year and has been partly surveyed; in the Prome district the circles of Yônzeik, Wètigôn, and Natmauk have been completed and those of Lèyedat, Lèywa, Myogwin, Sindè, Alodawya, and Sènatywa partially done; and in the Bassein district Ngaputaw circle has been completely done, while Kwinbaukgyi, Lèbyauk, Kyagan, and Kani were partly done.

Published 16-inch maps and 2-inch maps, where obtainable, of kwins bordering on the tracts selected for survey were got from the respective Superintendents of Land Records in connection with the work. These have been utilized for the purpose of getting the common boundaries between old and new work to correspond. Some traces of the 16-inch work of Thôngwa district had also to be obtained on payment for this purpose from No. 7 Party.

7. There will in all probability be a goodly number of plots of the traverse work that was in hand this field season got ready during the recess. In this case it will be possible for the field-to-field work to commence on the 1st December next punctually with a complete establishment consisting of nine Inspectors and 90 Field Surveyors. But respecting this the requisite information for which the Director has already written will no doubt be duly furnished by the Deputy Superintendent.

Survey by local agency next year.

It is expected that all three camps of the field-to-field survey will be fully occupied next season in working on the plots supplied by No. 12 Party in the five districts previously named.

8. Camps Nos. 2 and 3 kept very good health throughout the season; but No. 1 suffered very considerably in this respect. Taikgyi, the head-quarters of Camp No. 1, was noted for its fever-producing qualities, but this year the fever there proved a plague. The traverse camp lost a number of men from fever here and so shifted to Tawlatè, but it was quite impossible for the field-to-field camp to move from the place as the plots to be worked upon belonged to the locality and plots of no other circle were given which might have enabled the Myoôk to postpone the survey of the Taikgyi side to a later time. There were a great number of desertions among the kalassies and even the Field Surveyors, and it was with the utmost difficulty that men could be induced to accept service in these parts. Three Field Surveyors, two tindals, and seven kalassies succumbed to the Taikgyi fever in Rangoon, while three kalassies were rendered stone-blind from this cause.

Health of detachment.

In consequence of this great sickness in Camp No 1 progress of work was necessarily very slow, and it was not until about the middle of April, when extra Surveyors were advertised for and obtained, and the place had turned somewhat more healthy, and the transferring to this side of an Inspector and his squad from Camp No. 2 at Prome, where there was not sufficient work for the men to do, that the returns of work began to show up. Next season this camp will be employed chiefly on the Tawlatè side, where the same sickness to which they were subjected this year will, it is hoped, not follow them.

9. The Deputy Commissioners of the districts which were to be operated on by the field-to-field survey this year were written to by the Director to cause the necessary demarcation of gardens, orchards, burial-grounds, roads, monastery, pagoda, and school lands, and village sites to be done inaccordance with the Boundary Rules. In Bassein particularly this work was found in most cases not touched and the matter was duly brought to the notice of the Deputy Commissioner of the district, the Thugyis of Ngaputaw and Lèbyauk circles being singled out for punishment. In Prome the Deputy Commissioner was also addressed on the subject and he issued stringent orders, especially regarding the demarcation of "miscellaneous" or "kaing" cultivation, of which it was found impossible to trace the boundaries without the presence of the owners owing to posts being set up at the bare angles of each holding only and the non-existence of any fences, or cultivation by which the Surveyor could be guided. In Hanthawaddy the number of gardens, &c., was very limited, but here, too, as in the other two districts, a good deal of the demarcation work had to be done by or under the supervision of the Camp Officers and Field Surveyors themselves.

Demarcation of gardens, &c.

10. Half pipes were very largely employed for denoting permanent survey marks in the districts of Prome and Hanthawaddy particularly, but to no appreciable extent in Bassein. The matter was duly enquired into and a report on the subject submitted to the Director, on which action was taken. There was considerable destruction of pipes brought to light in Prome and Hanthawaddy, and the Officer in charge No. 12 Party and the Deputy Commissioners were written to on the subject. The marks put along roads, too, like those on the Prome road, would soon become obliterated when the annual repairs by the Public Works Department took place, besides being very liable to be broken by carts travelling over them. There were some errors of plotting found of survey stations in the maps of Prome and Hanthawaddy. Traces of these were prepared and sent to the Deputy Superintendent for rectification, and others will follow. In a few cases in the Prome district I myself found that the sight-vane duly fixed to a forward line would not fall upon the flag with which the intersection should have coincided; but this I attributed to the rough nature of the ground over which the traverse work had to be carried.

Use of half pipes, destruction to marks, and errors of work.

11. The proper size of good workable kwins should be from about 1 to 2 square miles, so that the detailed work might be conveniently fitted into one or two of the standard sheets. In some cases the areas have on survey proved very small. Where such is the case, and it is possible to amalgamate adjoining kwins, this will be done in the office and the map thus prepared for lithography, so that a saving in paper and cost might be effected.

Size of kwins.

12. The field season, which consisted of four and-a-half months, began on the 15th January 1890, and ended on the 31st May 1890, or about half-a-month earlier than it was intended to close outdoor operations. This was due to the early setting in of the rains this year and the country every-

Duration of field-season.

where being under water and ploughing in many places having begun in the middle of May. There was not the same extent of rainfall in Prome as in the country lower down, but yet it was sufficient to cause the closing of the work as the outturn would be inadequate compared with the expenditure that would have to be incurred on it.

Paying off of establishments.

13. On arrival at Rangoon all the purely field hands were paid the balance of their wages, the Field Surveyors getting what was due to them in accordance with their contract rates of payment-by-results. An examination in map-drawing was held, and those Field Surveyors who showed an aptitude for drawing and had otherwise deserved well in doing good work during the field season were found employment in the office for the recess.

Moneys earned according to the scale of contract charges.

14. The work of the Field Surveyors for the purposes of the table of rates was divided into three classes, namely,—

I class, signifying agreement like a trace.
II class, work that was generally out 10 or 15 links.
III class, work that had to be rejected.

Payments were made for work of the first two classes only, the rates for these being in the proportion of 5 to 4. In working out the calculation the average size of the field was also considered, this forming an important factor in the determination of the rates. Topographical and other features surveyed were paid for at a distinct rate according to class of work done. The total areas surveyed and amounts earned are shown for each camp separately in the statement. There were in all 69 Field Surveyors employed off and on in the party: the average earnings for these for complete and incomplete periods comes to Rs. 25-14-2 per head per mensem. But, if the broken and complete periods are taken all together, it would be equivalent to 52 Surveyors working throughout the four and-a-half months. According to this calculation the average monthly earnings of a Surveyor would come to Rs. 34-5-6, which may be considered a very reasonable rate. One Burman Surveyor belonging to Camp No. 3 did remarkably well, having earned in the season the total sum of Rs. 520-6-11. In No. 7 Party last year I have ascertained that, with 114 Field Surveyors employed for a term of five months, the average earnings per man per mensem was Rs. 33-15-1, or only slightly lower than our rate. If the very difficult nature of the country in which we have worked and the fact that cultivation is in patches, scattered throughout its length and breadth, and also of the smallness of the average field be considered, our rates compare most favourably with those of No. 7 Party, which has the reputation of being the cheapest worked cadastral party in Burma.

The average size of the field this year has been 0·405 of an acre, being largest in Bassein and smallest in Hanthawaddy. By the term "fields" is understood all cultivated or uncultivated paddy-fields, and all gardens, miscellaneous plots of land, tanks, bunds round tanks, and the like, of which the area does not exceed 10 acres. Items, the areas of which are above this, have been classed under the head of "Topographical and other features," which include hills, waste-lands, roads, rivers, creeks, jungle, and the like.

It will be remarked that the work of surveying topographical features was entrusted to the Field Surveyors, who were trained for the purpose by the Myooks and Inspectors at the commencement of field work. This duty in the Survey of India Parties it has been customary to assign to a special staff of Sub-Surveyors engaged on fixed monthly salaries. It was considered, however, that the work could be both cheaply and efficiently done by the Field Surveyors and so was made over to them, whom it benefited pecuniarily also.

Difficulties of survey and organization of party.

15. The difficulties of survey have been very great, namely, the nature of the country itself, as explained in the previous paragraph, the fact of the three camps being so far away from each other, the newness of the work to all the men from the camp officers down to the kalassies, the inexperience and in some cases ignorance of the fundamental principles of surveying, the scattered areas for survey in each camp, the getting of plots from the traverse camps, bits here and bits there, and, lastly, the unhealthiness of the tract selected for survey in Hanthawaddy and the heavy jungle-cutting which had to be done in all three of the districts.

The organizing of the party also took up a good deal of time and caused no inconsiderable amount of anxiety. The camp officers were Burmans, and the entire correspondence had to be done through the medium of the vernacular. All this, added to the fact that the men were mostly new to their duties, tended to enhance the difficulties of work. In Survey of India Parties the like difficulties are not usually met with owing to the department being an extensive and thoroughly organized one, with European officers in charge of camps and the men accustomed to their duties. In the matter of accounts particularly a good deal of work was thrown upon the headquarters office.

Outturn of work and proportion of cultivation to waste.

16. The total area completed comprises 213·96 square miles, divided for each of the three camps as follows:—

	Square miles.
For Hanthawaddy	67·41
For Prome	111·03
For Bassein	105·52

The area done in Prome is the largest, although the Myoôk of the Bassein side, who had the smallest establishment of the three, did nearly as much. The country Maung Tun (Bassein) worked in contained more cultivation, however, than in either of the other two districts, Hanthawaddy being the poorest in this respect. More work might have been done in Prome, but here there was a good deal of hill work and time was lost in sending men from one part of the country to the other. In Hanthawaddy the sickness that prevailed in Camp No. 1 seriously interfered with the outturn. Considering, however, that the detailed work was throughout the season at the heels of the traverse work, it is not easy to see how much more of an area could have been done. In Hanthawaddy the traverse work was caught up only towards the end.

The proportion of cultivation to waste for the entire tract surveyed is as 1 to 2·33, and for each district separately as follows, namely;—

In Hanthawaddy as	1 to 2·65
In Prome as	1 to 3·43
In Bassein as	1 to 1·58

Purchase of tents.

17. Camp officers were often much inconvenienced for want of shelter, so some cheap tents had to be procured for their use. In some villages little or no accommodation was procurable: kalassies had often to sleep at nights under trees and thus expose themselves to sickness. In Karen and Chin villages there was frequently no suitable hut for office use; then sickness sometimes existed throughout a village. Eight small tents, costing Rs. 348, for the purchase of which sanction was obtained, were bought and proved a great boon.

Recess work.

18. The recess work, which has now begun, will consist of the inking-in of the 16-inch maps, the typing, numbering, preparation of area statements in duplicate, the completing of the registers for the Supplementary Survey Office, the reduction of the maps to the 1-inch scale, and the preparing of the 16-inch and 1-inch maps for lithography.

Change of officers in charge.

19. Mr. C. J. Ford took charge of the Lower Burma Field-to-Field Survey Office from the afternoon of the 13th June, Mr. Clancey availing himself of the three months' privilege leave granted to him from the 14th idem.

Myoôks.

20. Maung San Dun has worked zealously and well, and is a reliable officer. He was in charge of Camp No. 1 working in Hanthawaddy. He was unfortunate in having so much sickness in his camp, which was the reason for his being unable to turn out a larger area. He himself was laid up for over a fortnight with fever, when his duties were temporarily taken up by Mr. Hardinge. Next year, it is hoped, Maung San Dun will meet with greater success all round.

Maung Pyu Than was placed in charge of Camp No. 2 in Prome. Hopes were entertained for his doing even a larger area of work than that turned out. He had difficulties to contend against, however, in having at first a good deal of hillwork to get through, when his Surveyors and even Inspectors had no idea of the subject. Later in the season better work was done, but yet he failed to report his men for punishment when they deserved it, and in consequence of this there was a certain amount of laxness and indifference to their duties displayed by both Inspectors and Field Surveyors. Next season better control over his men will be expected from him and larger areas of work should be done. Maung Pyu Than himself worked hard.

Maung Tun is deserving of commendation. He was in charge of Camp No. 3 in the Bassein district. It is true that there was more cultivation in parts under survey in his tract, but there were also some jungly bits, and the areas of work executed have been larger than those done by Camp No. 1 and almost as much as Camp No. 2. He has worked with praiseworthy zeal and exercises great influence over his men.

Mr. Hardinge assisted for a brief time in the work of Camp No. 1; but, as there was nothing particular for him to do here, and as the supply of plots was behindhand in the traverse camp, he was handed over to Mr. Buttress, the Camp Officer, in order that he may assist that officer and at the same time learn survey work, which would prove of service to him hereafter. Mr. Jackson the Deputy Superintendent was told of the temporary placing of Mr. Hardinge under Mr. Buttress. Mr. Buttress reports very favourably on Mr. Hardinge's qualifications and the good work he did with him for the three months or so that he was learning work in his office. Mr. Hardinge took charge of Camp No. 1 for a fortnight, while Maung San Dun was ill, and also assisted Maung San Dun for the last two weeks of the field season. Mr. Hardinge is a promising young officer and shows great aptitude for survey work. During the recess he will have charge of the Map department.

Field Surveyors, &c.

21. The Field Surveyors have on the whole done fairly well, considering that for the most of them it was their first experience of this description of survey work.

The men who were got from the Pegu side were infinitely superior to those who came from Hanthawaddy and elsewhere.

22. The total cost of the work, exclusive of that for holding-marking up to the end of the field season amounts to Rs. 43,624-11-9. The cost per acre so far amounts to Rs. 0-3-10. To this will have to be added hereafter the cost of the office during the recess, which, however, is comparatively very small, so that the cost may altogether amount eventually to about Rs. 0-5-1 per acre. This is not very high and, considering all the difficulties encountered, which have been previously enumerated, the fact that this is the first year of work where the initial cost, in the purchasing of furniture, setting up of an office, providing of tents, and the like, many of which are non-recurring charges, must necessarily be high, the extent of the field season being limited to four and-a-half months instead of the usual seven, and also that the area done being small the cost of supervision which would do equally for work appertaining to a larger area comes to be high. I consider that the results obtained have on the whole been highly satisfactory, In the Bassein district, where a fully organized and complete cadastral party with men who have done this sort of work for years did in their first year of 1879-80 only about 300 square miles, the outturn this year with us does not compare unfavourably. Besides this there is another point in connection with these surveys, which should not be lost sight of, and that is that the whole of the work is being done by a purely Burman agency, which is a decided advantage to the province. Burmans are as a rule paid better wages than the Natives of India, but a saving is on the other hand effected in salaries, &c., of officers, which are small as compared with those drawn by Survey of India Officers, in the non-employment of interpreters, in the not keeping up of Hospital Assistants and heavy baggage, and in the cost of conveying camps to and fro between India and Burma, and so forth.

Cost of operations.

In addition to the survey work proper the work of holding-marking and subsequent lithographing of the sheets locally is also to be undertaken by the party. This, if a proportion of the cost of supervision and office establishment, including draughtsmen, &c., were debited to these heads, would tend to reduce the cost of survey considerably.

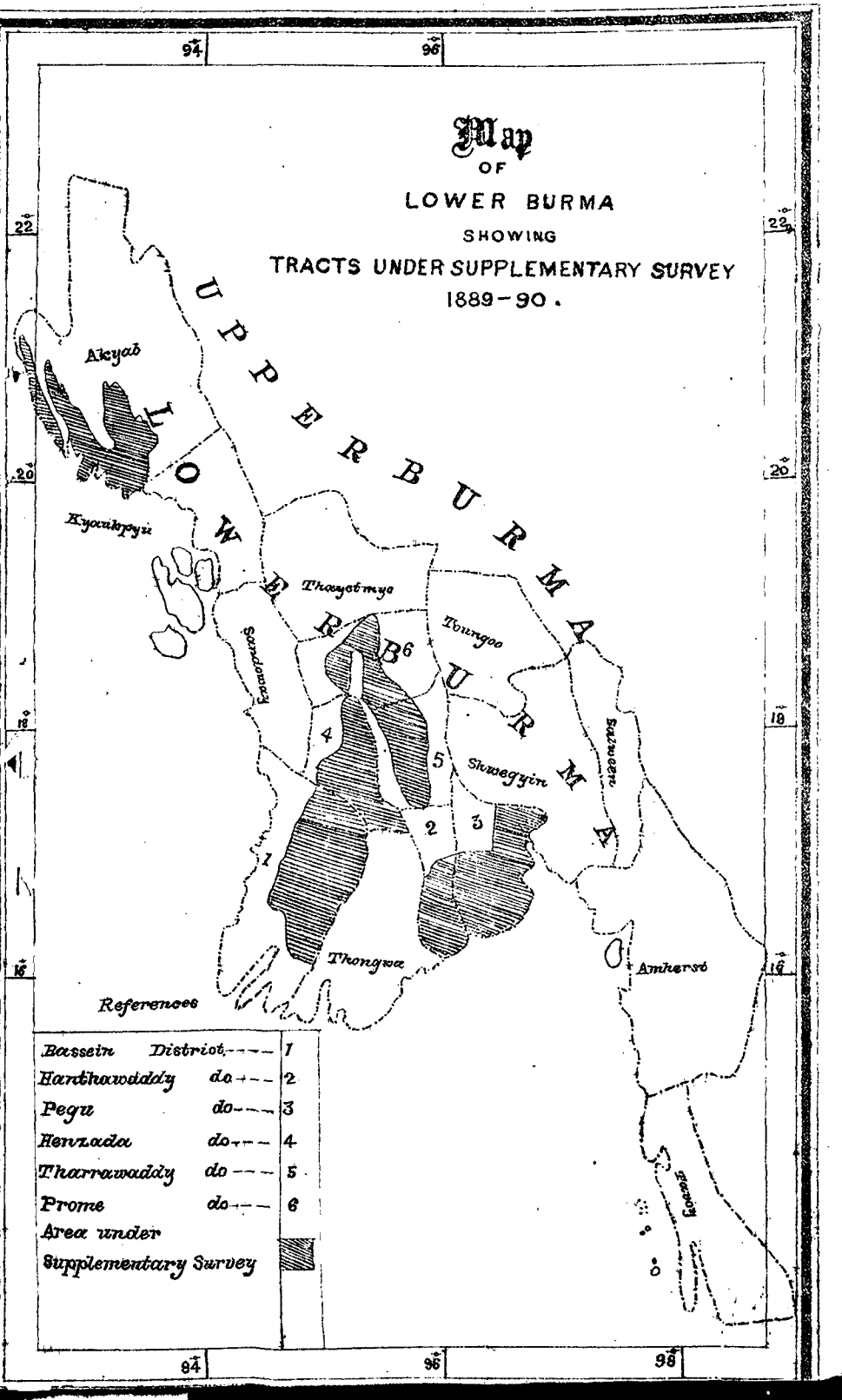
Holding-marking.

23. The cost for holding-marking, &c., comes to Rs.

Abstract of the various statements which accompany the Lower Burma Field-to-field Survey by Local Agency Report for 1889-90.

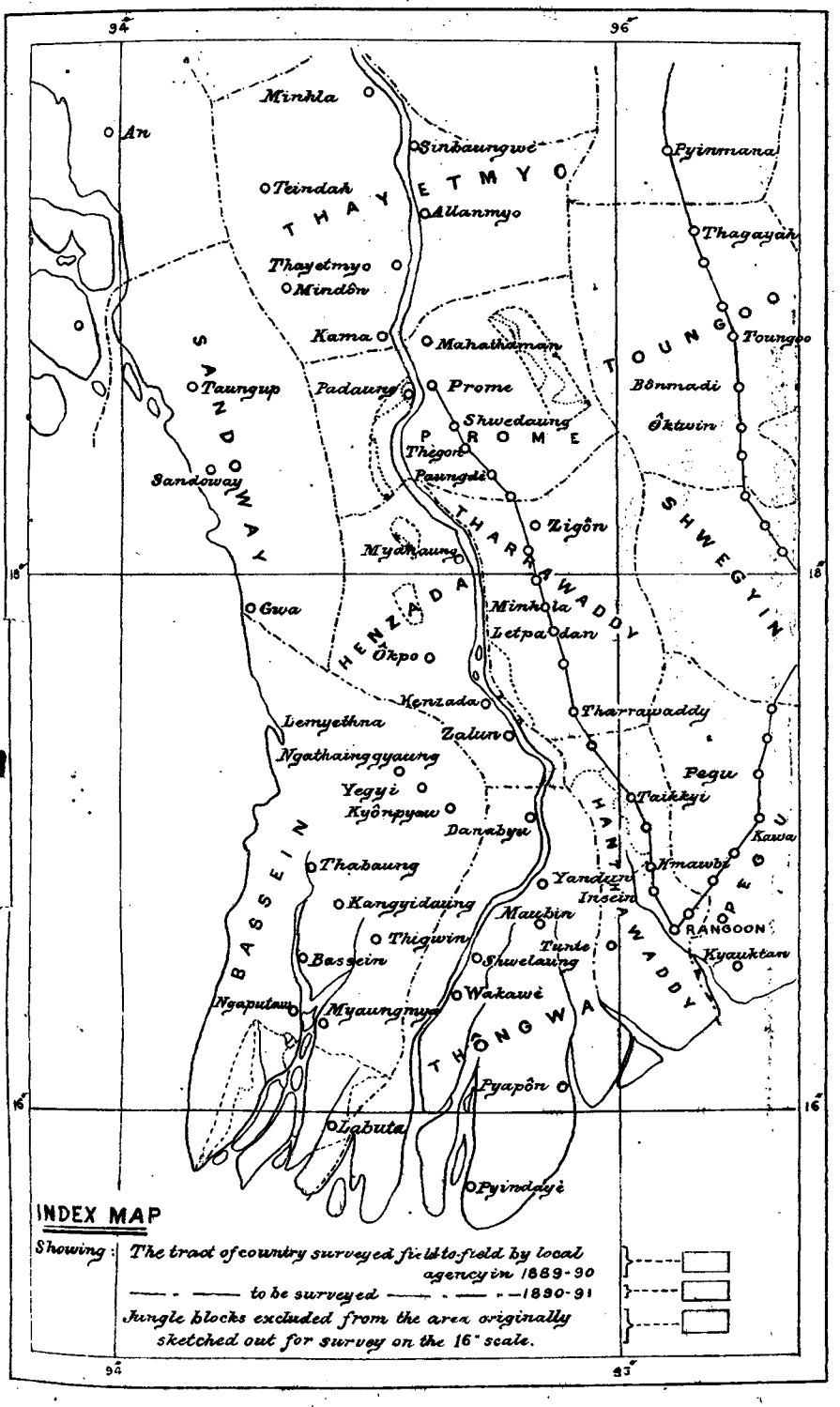
No. of camp.	District.	Number of kwin plots received during field season from traverse party.	Number of kwins completely surveyed by field-to-field survey.	Average number of days 86 surveyors were idle owing to non-receipt of plots from traverse party.	Number of fields surveyed.	Average size of field surveyed.	Area of field surveyed.	Area of topographical features surveyed.	Total area of all description surveyed.	Amounts less fines paid to field surveyors according to contract rates of payment.	Cost of operations to Government from 1st January to 30th November 1890.	Number of Inspectors employed for field-work.	Number of field surveyors employed.	Number of holding markers employed.	Number of kwin of which holdings were marked.	Area of holdings marked.	Cost for holdings-marking.
						Ac. Dec.	Acres.	Acres.		Rs.	Rs.					Acres.	Rs.
1	Hanthawaddy...	98	81	9·73	41,033	0·288	11,816	31,330	43,146	2,046	12,794	3	25	6	72	12,835	202
2	Promo ...	102	80	19·07	41,699	0·384	16,007	55,050	71,058	3,085	16,079	2	16	4	88	15,308	257
3	Bassein ...	135	103	11·68	50,479	0·518	26,154	41,378	67,532	3,132	13,148	2	13	4	103	24,308	443
Headquarters office.	...	...	...	...	...	...	...	...	...	...	15,823	...	...	...	...	...	...
Total ...	3	335	264	13·94	133,211	0·405	53,977	127,758	181,736	8,263	57,844	7	54	14	263	52,451	902

G. B. C. P. O.—No. 3311, D. L. R. & A., 26-10-90—360.


Map
OF
LOWER BURMA
SHOWING
TRACTS UNDER SUPPLEMENTARY SURVEY
1889-90.
UPPER BURMA
LOWER BURMA
Akyab
Kyaukpyu
Thayetmyo
Sandoway
Toungoo
Shwegyin
Salween
Thongwa
Amherst
Sittang
94°
96°
98°
22°
20°
18°
16°
References
Bassein District 1
Hanthawaddy do 2
Pegu do 3
Henzada do 4
Tharrawaddy do 5
Prome do 6
Area under Supplementary Survey

EXTRACT from a 16 Inch map of Kayan Circle, Pegu District, illustrating changes and extensions in field boundaries, since time of Cadastral Survey in 1879 – 80.

Firm lines denote fied boundaries of the Cadastral Survey still in existance. Firm lines cut out denote the bove which have been removed. Dotted lines show changes and extensions made by the supplementary urvey.


94°
96°
18°
16°
Minhla
An
Sinbaungwè
Pyinmana
Teindah
THAYETMYO
Allanmyo
Thagayah
Thayetmyo
Mindôn
Kama
Mahathaman
TOUNGOO
Toungoo
SANDOWAY
Taungup
Padaung
Prome
Bônmadi
Shwedaung
PROME
Ôktwin
Thegon
Paungdè
Sandoway
Zigôn
SHWEGYIN
THARRAWADDY
Myanaung
Gwa
HENZADA
Minhla
Letpadan
Ôkpo
Henzada
Tharrawaddy
Lemyethna
Zalun
Ngathainggyaung
Pegu
Yegyi
Taikkyi
Kyônpyaw
Danabyu
HANTHAWADDY
Kawa
BASSEIN
Thabaung
Kmawbi
Yandun
Insein
Kangyidaung
Maubin
PEGU
RANGOON
Thigwin
Tunte
Kyauktan
Bassein
Shwelaung
Wakawè
Ngaputaw
Myaungmya
THÔNGWA
Pyapôn
Labuta
Pyindayè
INDEX MAP
Showing: The tract of country surveyed field-to-field by local agency in 1889-90
to be surveyed 1890-91
Jungle blocks excluded from the area originally sketched out for survey on the 16" scale.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1890-91.

RANGOON: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, BURMA. DECEMBER 1891.

[Price,—Twelve annas.]

TABLE OF CONTENTS.

REPORT ON THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BURMA.

SECTION I.

MAINTENANCE OF THE VILLAGE RECORDS.

	Para.	Page.
Area under supplementary survey	1	1
Pegu, Tharrawaddy, and Akyab	2	ib.
Assessments in the area under supplementary survey	3	ib.
Cost of operations	4	2
Number and salary of officials connected with supplementary survey	5	ib.
Circles under supplementary survey in Lower Burma	6	3
Conduct of the Inspectors	7	4
Superintendents	8	5
Inspection of supplementary survey by Deputy Commissioners, Subdivisional Officers, and Township Officers	9	6
Permanent survey marks	10	ib.
Tracts which it will be necessary to re-survey at the end of the term of settlement	11	7
Inspection of records	12	ib.
Supplementary survey, Shwegyin district	13	ib.
Supplementary survey, Mandalay	14	ib.
Thugyis' records in unsettled circles	15	8

SURVEY.

Cadastral survey by local agency	16	ib.
Field work, 1890-91	17	9
Cost of the operations	18	10
Holding-marking	19	ib.
Increase in area and revenue due to the year's operations	20	ib.
Recess work	21	ib.
Mr. Clancey's report	22	11
Holding surveys	23	ib.
Special patta survey, Pegu district	24	ib.
Surveys in Upper Burma	25	12
Mr. Gibson's report	26	ib.
Duties of Mr. Gibson	27	ib.
Theodolite stations	28	ib.
Survey schools	29	13

SECTION II.

ANALYSIS OF DISTRICTS WITH REFERENCE TO SECURITY AGAINST FAMINE.

Analysis of districts	30	13

SECTION III.

SYSTEM OF COLLECTION OF REVENUE IN PRECARIOUS TRACTS.

Collection of revenue	31	13

SECTION IV.

FODDER RESERVES AND ARBORICULTURE.

Grazing-grounds	32	14

SECTION V.

AGRICULTURAL EXPERIMENTS.

Lashio experimental farm	33	14
Distribution of seeds	34	15
American maize seed	35	ib.
Barley	36	ib.
Potatoes	37	ib.
Tobacco	38	16
English vegetable seeds	39	ib.
Mergui experimental plantation	40	ib.
Agricultural shows	41	ib.

SECTION VI.

VETERINARY ESTABLISHMENTS AND CATTLE-BREEDING.

Veterinary Assistants	42	16
Cattle-disease	43	17
Establishment of Veterinary dispensaries	44	ib.
Stallions employed for stud purposes	45	ib.

SECTION VII.

AGRICULTURAL AND FISCAL STATISTICS.

Weekly crop reports and monthly statements of rainfall	46	18

SECTION VIII.

TRADE STATISTICS.

	Para.	Page.
Trade registration	47	18
Crop estimate	48	ib.

SECTION IX.

Charge of department	49	18

APPENDICES.

	Page.
A.—Area under supplementary survey and cost of the operations	iii.
B.—Assessments in the tracts under supplementary survey	iv.
C.—Agency by which the supplementary survey was conducted	ib.
D.—Supplementary survey inspection	ib.
E.—Result of corrections	v.
F.—Tables showing the nature of errors found by the Superintendents and Inspectors ...	ib.
G.—Condition of the permanent survey-marks	vii.
H.—Thugyis' commission and thugyis assistants' salaries	viii.
I.—Survey examinations in Lower Burma	ix.
Report on the operations of the Lower Burma field-to-field survey by local agency party for the year 1890-91	x.
Report on the special local survey operations of Upper Burma for the survey year 1890-91, by Mr. R. A. Gibson, Extra Assistant Commissioner	xxv

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1890-91.

SECTION I.

MAINTENANCE OF THE VILLAGE RECORDS.

Area under supplementary survey.

Supplementary Survey, Lower Burma.—During the year five circles of the Thôngwa district, with an area of 424 square miles, and four circles of the Bassein district, with an area of 272 square miles, were brought under supplementary survey for the first time. These circles were regularly settled in 1888-89.

The following circles and areas in Hanthawaddy and Prome, which were surveyed by the Local Agency Party under Mr. Clancey in 1888-89, were also brought under supplementary survey this year :—

	Number of circles.	Area square miles.
Hanthawaddy	1 ...	67
Prome	7 ...	100

In these circles no revision of the settlement took place, the old rates being applied to the new areas.

At the close of the year the Lemyethna township, comprising eight circles with an area of 198 square miles, was transferred from the Bassein to the Henzada district.

2. The area under supplementary survey in the remaining districts* remained the same as last year.

*Pegu, Tharrawaddy, and Akyab.

Assessments in the area under supplementary survey.

3. The increase in revenue in Pegu was Rs. 26,438 in the area under supplementary survey, principally due to extensions in the Laya, Yitkangyi, Kamun-ônhnè, and Megathan circles and to pattas falling under assessment during the year, particularly in Yitkangyi, where 3,500 acres of patta land were assessed for the first time. The fallow area in the district, however, increased from 35,456 acres last year to 39,931 acres this year, and this somewhat discounted the increase in revenue obtained. In Tharrawaddy the increase was Rs. 21,584, due to—

(i) revenue assessed in expired grants;
(ii) a decrease of 3,996 acres in the fallow area;
(iii) extensions amounting to 3,734 acres;
(iv) an increase of area due to a field-to-field survey of grants which had previously been shown in large blocks.

The increase in Akyab, Rs. 28,362, was due to assessment of patta land, extensions of cultivation, and to a decrease of the fallow area in all circles except three, namely, Kotabin, Yanchaung, and Shingyaw, where large areas were relinquished and left fallow on account of disturbances in the Yanchaung circle.

In Prome, although the area under supplementary survey increased by 100 square miles, the revenue assessed only increased by Rs. 6,497. This is due to a large increase in the fallow area in the Paungdè and Thegôn townships, where

the rains completely failed. As before mentioned the Lemyethna township was transferred from the Bassein to the Henzada district during the year, while 272 square miles of area were brought under assessment in Bassein for the first time; but taking the two districts together the revenue for the present year is only Rs. 8,613 more than that of last year; this is due to an increase of the fallow area in both districts. In Bassein the increase was enormous, namely, 66,465 acres. This is attributed to the large number of deaths of cattle from disease during the year, and the Commissioner remarks—

"I have satisfied myself by personal enquiries that this large increase has been justly ascribed to the abnormal number of deaths among cattle from disease, but at the same time I must point out that claims to have lands assessed at fallow rates have not in every case been properly dealt with. I have examined the records in connection with some of these claims and the procedure followed seemed to me faulty in the extreme. For example, a complaint came in that a certain area of fallow land had been assessed by the thugyi at full rates. The complaint was sent to the Superintendent, Land Records, who in turn passed it on to an Inspector, who reported the amount of the surplus assessment. In my opinion both the Superintendent and his Inspector were employed outside their legitimate sphere of operations. The complaint should have been presented and dealt with under Rule 99 (Rules under Burma Land and Revenue Act, 1876), and it was for the Deputy Commissioner to decide on the report of the Township Officer or Subdivisional Officer whether, with reference to Rule 87, the 2-anna rate was applicable. It was not alleged that the rice-fields had been left fallow in order to allow the soil to recover from exhaustion, and the Township Officer was the proper officer to enquire and report whether it had not been possible to fully cultivate the holding because of the loss of plough-cattle by disease. The Superintendent and his staff have more of their own legitimate duties to carry out than they can satisfactorily accomplish, and the Deputy Commissioner should be very chary of employing them outside their proper sphere on work that the Subdivisional and Township Officers are bound to perform."

With reference to this remark of the Commissioner's it is necessary to say that in practice all areas found fallow are as a rule assessed at the fallow rate as it is assumed that no person who can cultivate a field will leave it fallow and pay even 2 annas for nothing. The reason of the cultivator's complaint probably was that he had discovered that the thugyi (as is often the case) had omitted to mark the land in question as fallow on the map, and it had consequently been assessed at full rates. Although Rule 99 says that the Township or Subdivisional Officer shall report after enquiry, the Land Records Department is surely the proper agency through which the inquiries should be made, as in many cases there is no person in the township outside the Department who understands the maps at all.

In Henzada the increase in the fallow area is attributed by the Superintendent of Land Records to floods, but the Commissioner, Irrawaddy Division, remarks that part of it should be attributed to cattle-disease, which was very prevalent in Henzada also.

In Hanthawaddy the assessments in the area which was under supplementary survey last year have increased by Rs. 35,735: the assessment in the portion of the Myaungtanga circle brought under supplementary survey was Rs. 19,692.

Cost of operations.

4. The cost of the operations rose from Rs. 98,879 to Rs. 99,889, but the cost per square mile of area under supplementary survey decreased from Rs. 9-5-9 to Rs. 8-11-10. The increase in Henzada is due to the higher pay drawn by the Superintendent this year; in Tharrawaddy to the Inspectors drawing the sanctioned scale of pay; the increase in Akyab to the initial cost of mathematical instruments and of a set of area statements for a circle in which the thugyi's house was burnt down.

The decrease in Hanthawaddy is due to the increased area under supplementary survey and to the pay of the Superintendent being less than last year; in Pegu to the pay of the Superintendent being less than last year; in Prome to the increased area under supplementary survey. The decrease in Bassein is due to the pay of the Superintendent being less than last year and to the area under supplementary survey having increased.

Supplementary survey was started during the year in Thôngwa. In no other district was any addition made to the staff.

5. The following table gives the number and salaries of each class of official connected with supplementary survey:—

Statement showing the number and salary of each class of official connected with supplementary survey.

District.	Area of tract under supplementary survey.		Salaries of Superintendents.	Inspectors.				Thugyis.				Thugyis' Assistant Surveyors.				Remarks.
	Gross area.	Area assessed or held under temporary exemption.		Number.	Salary.	Average area of tract under each Inspector.	Average area assessed or held under temporary exemption under each Inspector.	Number.	Average annual earnings.	Average area of circle.	Average area assessed or held under temporary exemption in each circle.	Number.	Salary.	Average area of tract under each Surveyor.	Average area assessed or held under temporary exemption in the tract under each Surveyor.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Sq. m.	Acres.	Rs.		Rs.	Sq. m.	Acres.		Rs.	Sq. m.	Acres.		Rs.	Sq. m.	Acres.	
Pegu ...	2,018	775,507	400	4	60 to 100	504	193,877	38	2,233	53	20,408	44	17,803	46	17,625	The holdings are largest in Pegu and Hanthawaddy and smallest in Prome. The work is most difficult in Tharrawaddy and Bassein.
Hanthawaddy ...	1,476	500,314	500	4	60 to 100	369	125,078	35	1,923	42	14,295	34	14,703	43	14,715	
Tharrawaddy ...	1,096	329,934	200	4	50 to 80	274	82,483	25	1,268	44	13,197	42	14,123	26	7,856	
Prome ...	801	248,795	300	3	60 to 80	267	82,932	49	535	16	5,077	31	10,717	26	8,026	
Bassein ...	2,372	538,900	375	7	50 to 100	339	76,986	34	1,176	70	15,850	51	19,620	47	10,567	
Henzada ...	1,402	391,548	233	5	50 to 80	280	78,310	41	1,198	34	9,550	36	11,754	39	10,876	
Akyab ...	1,839	470,828	200	5	50 to 100	368	94,166	74	855	25	6,363	51	22,024	36	9,232	
Thôngwa ...	424	62,382	100	...	...	...	...	5	1,858	85	12,476	5	1,270	85	12,476	
Total ...	11,428	3,318,208	...	32	...	357	103,694	301	1,235	38	11,024	294	1,12,014	39	11,286	

6. There are now 315 circles under supplementary survey in Lower Burma. In Bassein, however, 51 circles are in the charge of 34 thugyis and in Henzada there are 41 thugyis to 45 circles. There are in all 301 thugyis. Of these 154 have qualified in surveying and 103 are reported to have taken part in supplementary survey work. Only 14 thugyis, however, were able to dispense with the assistance of a taikssayè, and as a general rule it may be said that thugyis do not take any part in the actual preparation of the field map and registers, although they assist in writing up the latter, and are useful in securing the attendance of cultivators. The thugyi is, however, the person responsible for the

correct preparation of the map and registers, and although he is allowed to employ an assistant it is his duty to see that the latter does his work properly. The common complaint made by Superintendents is that the thugyis when they have engaged an assistant are apt to leave him to his own devices and to consider themselves as absolved from responsibility for the correctness of the papers. The thugyis of Pegu, Hanthawaddy, Prome, and Akyab are said to have worked well, while those of Bassein are very badly reported of; all but five being described as indifferent and lazy in the field. The thugyis of Tharrawaddy are not favourably reported on; the thugyis of Henzada did not work well as a whole from the point of view of the preparation of land records, but they collected their revenue punctually and paid it in, and the Commissioner, Irrawaddy Division, remarks—

"From a revenue point of view the Henzada thugyis seem to have done fairly good work and it is satisfactory that 31 of them actually took part in the supplementary survey operations. Henzada is considerably in advance of Bassein in the art of managing thugyis, and I am sure that the Deputy Commissioner will not be in too great a hurry to shelve the older men of influence who, although they may not actually qualify in surveying, collect their revenue promptly."

In Thôngwa only one out of the five thugyis whose circles were under supplementary survey was able to help his taiksayè, and the taiksayès themselves were new and but imperfectly acquainted with their duties.

As a whole the taiksayès have worked fairly well in all districts. Mistakes of course are found, and considering the large areas which are under the charge of many of the taiksayès, I think it is almost inevitable that mistakes should occur, but as a rule the maps and registers are sufficiently accurate to enable them to be used as the basis of a new settlement when the term of the present settlement expires.

All the revenue-rolls were submitted punctually in the Prome, Hanthawaddy, Bassein, Thôngwa, and Akyab districts.

In Henzada all the rolls were submitted punctually except those of the Lemyethna township, which was transferred from Bassein during the year; these rolls were only nine days late.

In Pegu the rolls of 35 circles were submitted punctually. The rolls of the remaining three circles, however, were not submitted till March 11th owing to a proposal regarding increased rates of assessment being under discussion.

The rolls in Tharrawaddy were all submitted by February 25th; those which came in after February 15th being nearly all from the Sanywe township, the Sanywe Inspector and all the thugyisayès being on the sick list from January to March.

Conduct of the Inspectors.

7. The following statement compares the amount of inspection done by Inspectors during the present and preceding year:—

District.	Year.	Number of kwins in tract under supplementary survey.	Work done by Inspectors.		
			Number of Inspectors.	Number of kwins checked.	Average.
Pegu	1889-90	917	4	269	67
	1890-91	917	4	375	94
Hanthawaddy	1889-90	917	4	290	72
	1890-91	1,003	4	459	115
Tharrawaddy	1889-90	449	4	187	47
	1890-91	449	4	206	51
Prome	1889-90	365	3	178	59
	1890-91	465	3	245	82
Bassein	1889-90	1,241	7	268	38
	1890-91	1,202	7	546	78
Henzada	1889-90	468	5	218	44
	1890-91	626	5	322	64
Akyab	1889-90	1,005	5	429	86
	1890-91	1,010	5	476	95

It will be seen from the above that the number of kwins checked by Inspectors has increased in all districts, the increase being largest in Bassein; but in only two districts, Prome and Henzada, has the number laid down in the Directions for Supplementary Survey, namely, 50 per cent., been checked, but it is gratifying to note a general improvement in this matter. The tendency of Inspectors is to visit kwins which are easy of access and fully cultivated, and in which in consequence there is but little hard work to do. During the year a circular was issued prescribing that with each monthly progress report a map should be submitted showing the kwins inspected by each Inspector and the Superintendent. By comparing these maps with the map which accompanied this report last year it was possible to see whether the Inspectors were neglecting to check the kwins which had not been checked last year. Inspectors too are very liable to content themselves with pointing out mistakes, whereas of course it is their duty to see that the mistakes discovered are rectified. With the view of enabling the Superintendents at the time of re-checking kwins which had previously been checked by Inspectors to see at a glance what holdings have been checked by Inspectors, the latter have been ordered to enter on the map the numbers of the holdings checked by them. The Superintendent, Hanthawaddy, reports that at the beginning of the year the conduct of his Inspectors was not satisfactory. They confined their inspections to easy kwins adjoining the line of railway and had to be fined before they would make their inspections more general and searching. Some improvement has, however, taken place latterly.

All the Inspectors in Pegu worked well, with the exception of Maung Tha, who is in failing health and will probably have to resign.

The report on the work of Inspectors Maung Po Min, Maung San Kyaw, and Maung San Nyun, of the Tharrawaddy district, is not satisfactory, and the Commissioner remarks that these men evidently require strict supervision.

Nothing is said in the report about the conduct of the Prome Inspectors. Maung Po Byu, the senior Inspector of the Henzada district, is very favourably reported of, while Maung Shwe Nu of the same district is said to be quite unreliable and was reduced during the year. The other Inspectors of Henzada worked well. The Superintendent, Bassein, says that the Inspectors of that district have on the whole worked well and hard. He had a good deal of trouble with them at first as owing to this being his first year in the department the work was new to him. Towards the end of the year, however, the whole staff very much improved and Mr. Beechey particularly commends Maung Hpo Kye and Maung Louis. As shown in the statement given at the beginning of this paragraph there was a great improvement in the amount of testing done by Inspectors in Bassein as compared with the previous year. The Commissioner remarks—

"I am not as satisfied as Mr. Beechey is with the conduct of his Inspectors. In future their charges of misconduct against thugyis should be investigated by Subdivisional and Township Officers. Again, these officers will do well to bear in mind that to find a mistake is only four out of the 16 annas of work that must be gone through in order to correct it."

The Akyab Inspectors worked satisfactorily during the year.

Superintendents.

8. Statement D given in the Appendix shows the numbers of kwins in which the field-work was checked by Superintendents during the year. All of them have worked well. Special credit is due to Mr. Munro, Superintendent of Tharrawaddy, who made a vigorous effort to bring the maps of that district up to date by instituting a field-to-field survey in a large number of kwins. Owing apparently to the cultivation not being permanent at the time the district was cadastrally surveyed, even in fully cultivated kwins, in a very large number of cases, the field boundaries have been so much changed that the original survey map is useless as an index to the ground. During the year a considerable number of maps of this description have been brought up to date, and this difficult and important work has been well carried out by Mr. Munro. Mr. Torrens, Pegu, has his district in excellent order and has as usual worked very well. Mr. Ford is new to the Hanthawaddy district and finds the work in a backward condition in many respects, particularly as regards the area statements which in many cases have to be revised from the first year of supplementary survey. He is doing his best to bring the work up to date.

Mr. Beechey was disabled during the greater part of the field season owing to an accident while riding and consequently was only a short time on tour. During the short time he was out, however, he was very energetic. The work in Bassein is very heavy owing to the large area of the district and the shifting nature of the cultivation, and the large amount of extensions which have at present only been surveyed in large blocks. Mr. Beechey did his best to have the field-to-field survey well taken in hand, and should devote special attention to this next year.

All the other Superintendents, Maung Shwe Gyok (Prome), Maung Po Bye (Henzada), Maung Tha Do Pru (Akyab) worked well. Maung Po Bye, however, owing to illness was not able to do as much field work as was desirable, and at his own request he is to be allowed to revert to the regular line at all events for a time. It is very difficult to find a qualified man to take his place, and considering the large number of Superintendents likely to be required in a few years, I think it will be necessary to have three probationers in training instead of one as at present. The senior Land Record Inspectors who would naturally be the best persons for superintendentships unfortunately as a general rule do not know English, a knowledge of which is absolutely essential.

Inspection of supplementary survey by Deputy Commissioners, Subdivisional Officers, and Township Officers.

9. The Deputy Commissioners of Hanthawaddy (Mr. Macrae), Tharrawaddy (Lieutenant Maxwell), and Bassein (Mr. Weidemann), took a keen interest in the supplementary survey work and thoroughly inspected a considerable number of kwins. The Deputy Commissioner of Akyab was prevented by an accident from travelling during a considerable part of the year. The Deputy Commissioner of Pegu only inspected five kwins and the Deputy Commissioner of Prome only two. No cause is assigned for the small amount of inspection in Prome, but it is probably due to the frequent changes of officers during the year.

The Deputy Commissioner of Henzada, Major Butler, inspected the work in 16 kwins, and the Subdivisional and Township Officers in Henzada owing to his supervision did more testing than in any other district. In Prome the Subdivisional Officers only tested two kwins and the Township Officers 15. This is an extremely bad result and it appears as if the district officials in Prome dissociated themselves from the supplementary survey work, while of course it is a very important part of their duties to check it thoroughly and see that it is carried on satisfactorily.

The inspections by both Subdivisional and Township Officers as a rule, as far as I have been able to judge from the reports sent in, are of a rather perfunctory character, and I think that Deputy Commissioners should insist on the inspections being both more numerous and more searching, and it would I think have a salutary effect if Deputy Commissioners would themselves take up and test some kwins which had previously been tested by Subdivisional or Township Officers.

Permanent survey marks.

10. There are in all 102,995 permanent survey marks in the districts under supplementary survey; 45,888 were visited by thugyis and taiksayès during the year and 6,196 found broken and 7,707 found missing; of the total 13,993 injured or lost, 12,049 were replaced.

The thugyis were required to specially inspect one-third of the marks in their circles, but they also of course inspect marks which they come across during their ordinary field work in connection with the preparation of the register. In all districts the one-third of the marks specially allotted for this year was inspected and the index maps prepared according to rule. As far as I could ascertain, however, after the thugyis have visited these marks and reported having replaced those broken or missing there is no inspection by the Inspectors or Superintendents to see whether the marks reported to have been replaced have really been put down or not. The attention of Superintendents will be specially directed to this point during the next field season.

The figures given above show that of the marks inspected more than 30 per cent. are found to require replacing. This causes annually a large amount of work and expense, and with the view of protecting the marks as much as possible it has lately been directed that a mound of earth should be built over each and the landholder in whose land the mark is situated will be held responsible for seeing that the mound is properly preserved and protected from wilful damage. As

these permanent marks are absolutely essential in all cases in which it becomes necessary to re-survey a kwin District Officers should insist more than is done at present on the responsibility of village headmen and landholders in respect to their preservation.

Tracts which it will be necessary to re-survey at the end of the term of settlement.

11. Revised estimates of the area which it will be necessary to re-survey (at the end of the term of settlement) have been received from Hanthawaddy, Henzada, and Akyab only. The estimates given now are compared below with last year's estimates—

	Area which will have to be re-surveyed at the end of the term of settlement as estimated in 1889-90.	Area which will have to be re-surveyed at the end of the term of settlement as estimated in 1890-91.
	Sq. M.	Sq. M.
Hanthawaddy	141 ...	40
Henzada	117 ...	39
Akyab	17 ...	30

It will be seen that the estimates for Hanthawaddy and Henzada have been largely reduced. I am of opinion that if a vigorous effort is made to bring the maps up to date in this and the following years as has been done this year in Tharrawaddy and to a less extent in Bassein, there should be only a very small area in any district which will require re-survey at the end of the term of settlement.

This matter should be noticed in the supplementary survey reports of all districts annually and a revised statement should be given showing the progress made in bringing the maps up to date every year.

12. The records at the headquarters of the Akyab, Bassein, Henzada, Prome, Tharrawaddy, and Pegu district, were inspected by me during the year. With the exception of Bassein and Tharrawaddy all were in excellent order and well arranged; only a very small portion of the Bassein records had been arranged at the time of my visit, but Mr. Beechey had the work in hand, and it has since been reported that the records are now in good order. The record-room at Tharrawaddy was in very bad order when Mr. Munro took charge of the district; at the time of my visit although the records had not been completely arranged considerable progress in this direction had been made. The thugyis' offices are now regularly inspected by Superintendents and Inspectors and the stock of maps, registers, instruments, stationery, &c., compared with the stock books which are required to be kept up. The results of these inspections are reported in the monthly diaries. The great drawback to the orderly arrangement of thugyis' records is the want of proper office accommodation in the thugyis' houses. Thugyis are being urged to build offices or at all events to set apart a room in their houses entirely as a record-room. This has been done in Henzada and some progress has been made in this direction in other districts, but as thugyis are somewhat uncertain as to their position owing to the question of the abolition of circle thugyis having been mooted they are naturally rather reluctant to incur any extra expense.

Supplementary survey, Shwegyin district.

13. During the year a supplementary survey was carried on in the Pyuntaza subdivision of the Shwegyin district in the tract which had been surveyed by the holding survey party last year. The result was a further increase in revenue of 10 per cent., but as the District Inspector was the only inspecting officer, and he had much other work to do, the amount of check was quite inadequate, and the figures for many circles show that the work of either this or last year was unreliable. It is in fact almost impossible to conduct supplementary survey when the maps only show holding boundaries, and it has been decided to discontinue this survey. The maps and records already prepared will, however, serve as a rough check on the areas returned by thugyis.

Supplementary survey, Mandalay.

14. Revenue rates have not yet been sanctioned for the tract in Mandalay which was under supplementary survey last year, but the maps and registers have been kept up to date and can be utilized for the preparation of the

revenue-rolls as soon as the rates are sanctioned. During the year the number of surveyors was reduced from eight to six; all of these are paid by Government.

Although the revenue collections are not based upon the areas shown by the supplementary survey still these areas ought to have been used as a check upon the areas returned by the thugyis. I found, however, on enquiry, that no use whatever had been made of them. This matter is now I believe receiving attention, and the table given below comparing the area, as found by the supplementary survey and as returned by the thugyis, shows that such a check is very necessary:—

Year.	Thugyis' area.	Survey area.	Difference.	Percentage over thugyis' area.
1889-90	14,900	24,520	9,620	64·56
1890-91	13,387	21,446	8,059	60·20

About 3,000 areas of unirrigated land claimed as bobabaing are excluded in the thugyis' area and included in the survey area. In round numbers the areas actually cropped during the past two years may therefore be said to be—

Year.	Thugyis' area.	Survey area.	Percentage over thugyis' area.
1889-90	17,900	24,520	36·98
1890-91	16,400	21,450	30·79

A large number of valuable statistics relating to tenants, crop outturns, &c., have been collected by Mr. Gibson, and these will prove extremely useful to the Settlement Officer when the settlement of the district is taken in hand. The average rents paid per acre by tenants of bobabaing land are—

Description of land.	1889-90.	1890-91.	Average rent for two years.
	Rs.	Rs.	Rs.
For two-crop land	9·55	8·79	9·17
For one-crop land	6·03	6·75	6·39

Maung Byaung, the Inspector in charge under Mr. Gibson, worked well and inspected the field work in all (79) the kwins under supplementary survey. The cost of the operations was Rs. 6,035-10-0 up to the end of June 1891 against Rs. 4,052 last year. The increase is due to the establishment having been employed 12 months instead of eight months as in last year.

Thugyis' records in unsettled circles.

15. In districts which are under supplementary survey the thugyis' records in unsettled circles are checked by the officers of the Land Records Department, in other districts by the District Surveyor and other district officials.

In neither case, as far as can be judged, is the checking of much value, and as unsettled circles are often at a considerable distance from the Inspectors' circles a good deal of time is occupied in this work to very little purpose. In the absence of maps it is almost impossible to check efficiently. In Pegu only one unsettled circle was checked by the Land Records Inspectors. In Hanthawaddy 50 kwins and in Bassein 35 kwins were checked, and all the five Inspectors in Akyab are said to have checked work in unsettled circles, but details are not given. In the other district reports no reference is made to this subject.

SURVEY.

Cadastral survey by Local Agency.

16. At the close of the field season of 1889-90 an area of 284 square miles had been cadastrally surveyed by the Local Agency Party under Mr. Clancey. During the recess season, June—December 1890, the inking in, numbering, printing, and typing of the 16-inch maps, and the completion of the registers and first year's maps for supplementary survey was effected. The 16-inch maps were reduced to the 2-inch scale, and the maps on both scales prepared for lithography: and the maps and registers were made over to the Deputy Commissioners concerned by 18th December 1890. These maps and registers were used for supplementary survey in Hanthawaddy and Prome, but owing to local difficulties the work was not begun in Bassein.

The work of lithographing and publishing the maps was effected in the Government Press, Rangoon, the sheets being prepared on the lithographic paper in the Field-to-field Survey office. The cost of the work approximately was Rs. 14-8-0 per 16-inch sheet and Rs. 21-12-0 per 2-inch sheet, or little more than half the cost as estimated by the Survey of India Department. In addition to the saving in cost another great advantage in having the sheets published locally is that the work is finished during the recess season following the field season in which the survey was effected, whereas the Survey of India Department could only promise to supply the sheets in one or two years and then only provided no other pressing work intervened.

Field work, 1890-91.

17. At the commencement of the field season the strength of the party was raised to 90 field surveyors, all of whom, with the exception of six Hindustanis, were Burmans. Among the Burmans were 17 who had been working in No. 7 Party of the Survey of India under Mr. Bridges' scheme, it being arranged that service with the Local Agency Party should count as part of the term of five years required to obtain the certificate and bonus under that scheme.

During the year work was carried on in the Hanthawaddy, Tharrawaddy, Prome, Bassein, and Henzada districts, the party being divided into three camps. No. 1, under Maung San Dun, worked in Hanthawaddy and Tharrawaddy, No. 2, under Maung Pyu Than in Prome, and No. 5 under Maung Tun in Bassein and Henzada. These camps took the field on December 1st with sufficient 16-inch traverse plots in hand to keep them fully employed for two months, and it was hoped that by the 1st February a further sufficient supply of plots would have been received by all three camps from No. 12 Traverse Party. But with the exception of Camp No. 2 the camps were disappointed in this respect and a certain number of men had to remain in enforced idleness for a considerable time. This was partly due no doubt to the difficult nature of part of the country in which the traverse party was working and to the tracts for survey being scattered over several districts, but considerable difficulties might have been avoided if the officer in charge of the traverse party had informed Mr. Clancey of the approximate times and places at which traverse plots might be expected. When it was found that the supply of traverse plots was very scanty and irregular it was decided to survey on the triangulation system, taking up the traverse stations if they were marked on the ground or linking the work on to them afterwards if the marks had not been put down.

Ninety-seven kwins with an area of 197 square miles had to be surveyed on this system, and the cost of the year's work, both in field and office, was of course considerably enhanced by this and by the enforced idleness of the surveyors.

The statement given below shows district by district the area surveyed cadastrally during the year under report, the area surveyed last year, and the area proposed for survey by the local party during the next two years—

District.	Area surveyed in 1889-90.	Area surveyed in 1890-91.	Area proposed for survey.
	Sq. miles.	Sq. miles.	Sq. miles.
Hanthawaddy	67·41	340·85	...
Henzada	...	416·81	...
Tharrawaddy	...	126·25	...
Prome	111·03	483·50	361·41
Bassein	105·52	73·12	658·16
Thôngwa	...	...	109·00
Thayetmyo	...	...	300·00
Kyaukpyu	...	...	786·00
Total ...	283·96	1,440·53	2,214·57

It will be seen from the above that notwithstanding the delays in the receipt of traverse plots an excellent outturn of work was secured and great credit is due to Mr. Clancey and the officers working under him for their good work during the year.

Mr. Clancey has great powers of organization and it is mainly due to his energy and perservance in the face of many difficulties that the excellent results shown above have been obtained.

Of the three camp officers Maung San Dun is reported to have worked excellently, and Maung Pyu Than and Maung Tun also worked very well.

Mr. Hardinge, Myoôk in charge of the Map Section, also did excellent work, and during the ensuing field season he is to be placed in charge of one of the two traverse camps.

Cost of the operations.

18. The following statement shows the cost of the operations during the present and past year :—

Year.	Area cadastrally surveyed.	Cost.	Rate per mile.	Rate per acre.
		Rs. A. P.	Rs.	Rs. A. P.
1889-90	283·96	49,700 0 0	175	0 4 4
1890-91	1,440·53	97,320 3 11	67	0 1 8

Of the Rs. 97,320-3-11 Rs. 78,002-11-11 is the actual expenditure during the field season and Rs. 19,317-8-0 the estimated expenditure during the recess.

The proportion of cultivation to waste is 1:5:11 ; this is much higher than last year and points to the fact that some areas were surveyed which were not worth surveying cadastrally, but making all allowances for this the cost per mile, which is little more than one-third of last year's cost, is very low. During the year the Traverse Party (No. 12) surveyed 1,280 square miles at a cost of Rs. 78 per mile. Taking the same cost for the area surveyed cadastrally by the Local Party this year the total cost of the survey, cadastral plus traverse, comes to Rs. 145 per square mile.

Holding-marking.

19. In addition to the field-to-field survey the work of holding-marking in the areas surveyed was completed during the year at a cost of Rs. 2,222-11-1. More attention was paid to this work during the year under report than had been done in the previous year and the work has been carefully checked.

Increase in area and revenue due to the year's operations.

20. The increase in the area under assessment over the thugyis' areas of 1889-90 due to the survey by the Local Agency Party is 47,658 acres with a revenue demand of Rs. 81,950. The figures for 1889-90 are contrasted with the areas obtained by the Local Agency Party because the thugyis of Hanthawaddy and Bassein from fear that their annual under-measurements would be exposed arbitrarily increased their areas in the present year as the following table shows :—

District.	Percentage of increase in area		Percentage of increase in revenue	
	Over thugyis' figures of		*Over thugyis' figures of*	
	1889-90.	1890-91.	1889-90.	1890-91.
Hanthawaddy	47·12	19·28	46·46	19·19
Bassein	201·43	158·27	199·27	157·96

Recess work.

21. Arrangements have again been made for lithographing and publishing the maps locally in the Government Press. This and the other recess work is now well in hand, and it is hoped that kwin traces with holdings marked will be ready for distribution to Deputy Commissioners in time for them to be used for supplementary survey in season 1891-92.

22. Mr. Clancey's report *in extenso* forms an appendix to this report.

Holding surveys.

23. During the year holding surveys of the kind described in paragraph 26 of last year's report were carried on in the Toungoo, Shwegyin, and Sandoway districts. The result of these surveys is shown in the table given below :

District.	Area assessed or held under temporary exemption and revenue demand				Increase in 1891		Percentage of increase	
	As given by the thugyis in 1889-90.		*As found by survey in 1890-91.*					
	Area.	Revenue demand.	Area.	Revenue demand.	In area.	In revenue.	In area.	In revenue.
	Acres.	Rs. A. P.	Acres.	Rs. A. P.	Acres.	Rs. A. P.	Acres.	Rs.
Shwegyin ...	19,793	25,284 1 9	24,223	34,822 6 4	4,430	9,538 4 7	22	38
Toungoo ...	23,092	27,671 6 8	29,113	34,269 1 7	6,021	6,597 10 11	26	24
Sandoway ...	23,556	30,218 6 10	29,888	37,959 14 3	6,332	7,741 7 5	27	25
Total ...	66,441	83,173 15 3	83,224	1,07,051 6 2	16,783	23,877 6 11	25	29

The cost of these surveys to Government was in Shwegyin Rs. 1,471, Sandoway Rs. 3,518, and Toungoo Rs. 1,760.

In the Akyab district a holding survey was carried on under the Superintendent of Land Records, special Surveyors being engaged. The area thus surveyed was 29,276 acres, the cost to Government being Rs. 1,200 and to the thugyis Rs. 1,371-13-6. The increase in area obtained was 7,546 acres and in revenue Rs. 7,954.

The holding surveys in districts in which there is not a Superintendent of Land Records depend greatly for their success on the amount of supervision and inspection on the part of the District Officers.

In the Sandoway and Shwegyin districts District Officers did no checking, and a thorough inspection of the work in Shwegyin by Mr. Hardinge of the Lower Burma Field-to-field Survey Party revealed the fact that the maps in that district were quite worthless as an index to the ground, and as a rule could not have been prepared on the ground. The work in Toungoo proved on inspection to have been very well done. This was due to the Inspector in charge being a very careful and reliable man. The work in Sandoway was not checked, there being no officer available for the purpose.

The holding surveys in fact though very useful for the actual year of survey when carefully conducted, as giving a fairly accurate basis for assessment, are of very little value in subsequent years, as the maps prepared cannot be used to any purpose for supplementary survey work, for which a field-to-field survey is absolutely necessary.

The districts of Shwegyin and Toungoo are shortly to be surveyed cadastrally by the Survey of India Department, while Amherst is now being surveyed ; Tavoy and Mergui are to be taken up next field-season. The unsurveyed areas in the other districts will be surveyed cadastrally by the Local Agency Party during the next two years, so there is no real necessity for any further holding surveys and it has been decided to discontinue them.

Special patta survey, Pegu district.

24. An area of 9,096 acres of grazing-ground in the Kadônbaw circle, Pegu district, was thrown open for cultivation during the year. A theodolite traverse was run round this area and the whole area divided into three kwins having natural boundaries. These kwins were divided into patta blocks of 20 to 40 acres, all of which were allotted during the year, many applicants having to be refused. The cost of survey, Rs. 3,517, was more than covered by the fees realized from the persons taking up the pattas.

Surveys in Upper Burma.

25. At the beginning of the year holding surveys were in progress in Shwebo, Ye-u, Sagaing, Pakôkku, and Minbu. These continued till April, when it being recognized that it was extremely difficult for Mr. Gibson, the officer in charge, to exercise efficient supervision over such a large number of scattered parties in addition to his other work, it was decided to amalgamate the five parties into two to work in Shwebo and Yamèthin. The work in these two districts was the cadastral survey of the royal and irrigated lands on the basis of a theodolite traverse run under Mr. Gibson's superintendence. This survey was continued till the end of the year, and it is intended that it shall be carried on during the next field season.

The following statement shows the area surveyed (1) by holdings (2) cadastrally during the year and the cost of the operations :—

	Area surveyed.			Cost.
	Cultivated.	Uncultivated.	Total.	
	Acres.	Acres.	Acres.	Rs. A. P.
Holding survey	38,423	9,086	47,509	10,690 2 0
Cadastral survey	16,719	2,835	19,554	13,151 10 0

The cost of the cadastral survey includes the cost of the preliminary traverse and of an area of 36 miles traversed in advance for next year, and also the cost of holding-marking and the preparation of holding registers. The cost of the cadastral work is high because it includes the following items which will not be recurring charges :—

(*a*) the cost of the passage of six detachments from different scattered districts to the ground of work;

(*b*) the initial cost of necessary stores, das, pick-axes, spades, camp furniture, &c.

Most of the men were untrained in theodolite work and had to be taught by Mr. Gibson, the work too was carried on in May and June, the two hottest months of the year, and this necessarily diminished the rate of progress.

The following statement shows the increase in area due to the holding and cadastral surveys :—

Area under assessment or assessable area		Increase in area.	
As shown by local officials.	As found by present survey.	Acres.	Percentage.
Acres.	Acres.		
16,876	27,644	10,768	63·81

26. In addition to the surveys above described Mr. Gibson was in charge of the Topographical survey of the oil-fields in the Magwe, Myingyan, Minbu, and Pakôkku districts and of the survey of the coal-field in Shwebo. The total area thus surveyed was 112·80 square miles at a cost of Rs. 36,300. A full account of these surveys is given in Mr. Gibson's report, which forms an appendix to this report.

27. Mr. Gibson was also in charge of the supplementary survey in the Mandalay district described in paragraph 14, and of the supplementary survey in Mandalay town, and deserves very great credit for the excellent manner in which he has carried on his multifarious duties which, in connection with the oil-fields surveys, were especially arduous and important.

28. With reference to the concluding portion of paragraph 2 of letter No. 505-12—2R., dated the 9th March 1891, from the Secretary to the Government of

India, Revenue and Agricultural Department, to the Chief Commissioner, Burma, it may be remarked that the theodolite stations in the surveys conducted by Mr. Gibson, have been permanently marked in the same way as is done by the Survey of India Department. The surveys executed by Mr. Clancey's party were based on a traverse executed by the Survey of India Department. The traverse and trijunction stations in the area to be surveyed by Mr. Clancey's party during the ensuing year will be permanently marked in the same way as is done by the Survey of India Department.

The orders of the Government of India were received too late for the trijunction points to be marked in the areas surveyed by the holding surveys, which were completed by 31st March, and in any case these surveys are too inaccurate to enable their marks to be taken up by a professional traverse party. Moreover, the areas so surveyed are shortly to be surveyed cadastrally by the Survey of India Department or by the Local Agency Party and no fresh surveys of the kind are to be carried on henceforth.

Survey schools.

29. During the year the Sandoway Survey school was closed, and no new schools were opened. The statement given in the appendix shows the numbers of candidates who passed the Syndicate examination in Lower Burma. In Upper Burma examinations were held under the supervision of Mr. Gibson and another officer from either the Public Works Department or Survey of India Department, the papers set being sent for approval to the Director. The following list shows the number of successful students from each Survey school in Upper Burma :—

Kyauksè	12
Sagaing	16
Yamèthin	3
Minbu	*Nil.*
Mandalay	13

The survey teacher at Minbu was found to be incompetent and was dismissed, his place being taken by the assistant survey teacher from Pegu. I inspected the Survey schools at the marginally noted places during the year. The teaching was generally found to be efficient, although I am of opinion that some of the subjects taught, *e.g.*, mensuration of surfaces and geometrical drawing (as distinct from ordinary mapping) are not necessary for thugyis and taiksayès and serve to needlessly prolong the course. In the districts under supplementary survey I found that as a rule the Superintendents did not pay sufficient attention to the Survey schools in their districts, leaving every thing to the survey teacher. The result was that a want of system was apparent in the teaching. This was pointed out to the Superintendents concerned, and will doubtless be remedied in future.

Akyab.	Kyauksè.
Bassein.	Mandalay.
Henzada.	Yamèthin.
Pegu.	Minbu.
Prome.	Sagaing.
Tharrawaddy.	

There is practically an unlimited demand for surveyors in Burma, particularly in Upper Burma, which will all be cadastrally surveyed within the next few years and will consequently require a large number of trained surveyors for the supplementary survey work.

SECTION II.

Analysis of Districts with reference to Security against Famine.

30. Such information as has been received from District Officers has been incorporated in the analysis previously made, but the information received was of a very general and not very accurate description.

District Officers have now been asked to submit revised analyses of their districts in the light of the experience of the present season during which there has been and is scarcity in most of the districts of Upper Burma. It is hoped that the information now supplied, being based on actual experience, will be of a reliable character.

SECTION III.

System of Collection of Revenue in Precarious Tracts.

31. No change has been made in the method for granting remission of revenue.

SECTION IV.

Fodder Reserves and Arboriculture.

32. A very large area was reserved for grazing-grounds in the Tharrawaddy district during the year. Considerable additions were also made to the grazing-ground areas in the Henzada and Akyab districts. In Pegu a large area was added owing to the formation of new land along the Salween river and the sea-shore. In Pegu 13,369 acres of grazing-grounds were thrown open for cultivation during the year, and it is proposed to throw open large areas again this year, pattas for from 20 to 30 acres being allotted as in the case of the Kadônbaw circle (see paragraph 24). Proposals for the survey of these areas are now under consideration.

In Prome there are only 3,166 acres of reserved grazing-grounds, a very marked contrast to the enormous areas reserved in many districts. The people of Prome, however, manage very well and it is doubtful whether the reservation of very large areas is an unmixed advantage. In the parts of India which are most highly cultivated (*e.g.*, the North-West Provinces) people cannot keep many cattle, but are compelled to stall feed those they do keep, and the cattle though fewer in numbers are therefore better cared for and are less liable to disease. Considerable attention was paid to the demarcation of grazing-grounds during the year and missing or broken marks were replaced. In several districts prosecutions were instituted against persons encroaching on grazing-grounds. The grazing-grounds in the Thôngwa district have not yet been demarcated.

SECTION V.

Agricultural Experiments.

33. *Lashio Experimental Farm.*—The operations of the farm may be divided into—

(i) experimental cultivation;
(ii) sheep farming;
(iii) dairying.

Experimental cultivation.

Forty-two acres were sown with wheat, the sowings taking place from September 2nd to September 9th. The experiment was practically a total failure. Out of five fields three produced nothing at all, while the remaining two gave 600 lb. for 880 lb. sown. The failure is attributed by Mr. Hillier, the Farm Superintendent, to the seed being sown too late, and this year he proposes to sow in August. Most of the wheat died off in September, when there was a trying break in the rains. I am of opinion, judging from Indian experience, that the seed far from being sown too late was sown much too early, and that in addition to this the causes of failure were that the seed was sown broadcast, and the quantity sown per acre (40 lb.) was quite insufficient. The fields received more than 7 inches of rain after the seed was sown, which is far more than a wheat field gets as a rule in India. As Mr. Hillier thinks that the wheat will succeed if sown in August he is being allowed to try the experiment, but he has also been directed to sow some in October and November, and his attention has also been drawn to the two other points mentioned above. During the next cold season I intend, if possible, to visit Lashio to see whether the soil of the farm is suitable for wheat.

Maize was sown in 12 acres; in one field of 5 acres it was sown with cotton, the latter failed and the maize yielded 10-fold. Another field of 5 acres, which was manured and in which maize was sown alone, yielded 20-fold. One field of 2 acres sown with maize on the 28th June yielded nothing, owing, the Superintendent says, to the soil being poor, but also I think to the sowing being too late. The maize experiments may be said to have been successful on the whole. Green gram and Madras gram were successfully grown, but sugarcane was a failure owing to its being sown at quite the wrong time (July), although the Superintendent attributes the failure to the crop being attacked by field-mice. During the next season it is to be hoped that the wheat cultivation will prove successful as this is the main crop which it is desirable to introduce in the Shan States.

Sheep farm.

The original strength of the sheep flock was 53; during the year there were 14 deaths amongst the full-grown sheep, and the births during the year have just kept up the original strength. The sheep have now got acclimatized and freely eat artificial food. Last year owing to their having to be grazed during the rains they suffered severely from foot-rot. They were sheared twice during the year and 200 lb. of wool was obtained. The cross between the Madras and Chinese sheep are better than the original stock both in flesh and wool-producing qualities, and there is every prospect of the sheep farm thriving in future.

Dairy farm.

The dairy farm was commenced with a herd of 20 cows, 11 calves, and one Australian bull, the initial cost being Rs. 610. Ten calves have been born since and there have been no deaths. The cows were all in calf when purchased; the actual sale of milk began in January 1891, and up to 1st April 1891 Rs. 200 had been realized. The farm shows symptoms of being a decided success.

General.

A pony and donkey stallion have been sent to Lashio and it is intended that they shall be taken round during the next camping season, and the Superintendent is confident that the Shans will take keenly to mule-breeding. It is also intended to hold agricultural shows and offer prizes for cattle, ponies and mules, and arrangements are now being made.

During the year a blacksmith and carpenter were engaged and sent up to Lashio. Two graduates of the Bombay Veterinary College were engaged as salutries; they joined at Rangoon and set out for Lashio *viâ* Mandalay, but on the road between Mandalay and Lashio they lost courage, turned back, and returned to Rangoon, where they resigned their appointments. A pensioned military policeman, who holds a veterinary certificate, has lately been engaged and is now on his day to Lashio. Mr. Hillier was in charge of the farm during the whole year and weserves credit for his zeal and energy, which is testified to by Lieutenant Daly, Superintendent of the Northern Shan States.

Distribution of seeds.

34. Wheat seed was distributed to the Upper Chindwin, Lower Chindwin, Ye-u, and the Southern Shan States. The experiment in the Upper Chindwin was on a large scale, 300 baskets (330 bushels) of wheat being sent to the district, 200 baskets being sent to Legayaing township, and 100 to Uyu township. The only place where it succeeded was in Taungdwin, where 18 baskets sown produced 360 baskets, showing conclusively that wheat can be grown successfully in this district. In the other places failure was due to ploughing not being deep enough and to unsuitable soil being chosen. A fresh supply of seed is being sent up this year. In the Lower Chindwin 45 baskets sown produced only 87¾ baskets. This was due to the land not being properly prepared as the cultivators from Sagaing who were sent up to show the people how to cultivate wheat only arrived at sowing time, and the ground had not then been got ready. After the crop came up no rain fell and it was also attacked by white ants. The experiment in Ye-u was successful, the average outturn being 7-fold. The wheat sent to the Southern Shan States arrived too late; it was given to the Monè Sawbwa for distribution, but no crop was obtained.

35. American maize seed was supplied to Sagaing, Lower and Upper Chindwin, Yamèthin, Kyauksè, Shwebo, Toungoo (Mr. Petley), and Thayetmyo. It was generally successful, particularly so in the Upper Chindwin, Yamèthin, and Kyauksè, where the people have regularly taken to its cultivation. When enquiries were made from the Deputy Commissioner, Lower Chindwin, as to the result of the experimental cultivation of the maize sent to him it was found that the tin containing the seed had lain unopened in the district office the whole year. Mr. Petley at Toungoo finds that May is the right time for sowing maize in those hills, as when sown in October or November it is destroyed by rats.

36. Barley was distributed to Thayetmyo, Ye-u, and Minbu, but failed in all cases, the cause of failure in Ye-u being that the seeds were weevilled, in the other two cases the season was unfavourable.

37. Potatoes were sent to Meiktila, Minbu, and Thayetmyo; they failed in the two latter districts and succeeded fairly in Meiktila.

38. Tobacco was sown in Minbu, Upper Chindwin, Sandoway, and Mergui. In Minbu some Havanna tobacco sown in land near the river succeeded, and Virginia in Salin also did well; and the flavour was said to be better than that of the Burmese tobacco. Tobacco was also sown in the Sagu, Mapè, and Legaing townships, but failed. Havanna tobacco was grown very successfully in the Upper Chindwin, and the soil is said to be very suitable, but the people do not know how to cure the tobacco which consequently loses the greater part of its value. The Virginia tobacco succeeded in Sandoway, but the Havanna failed, although it was grown under careful supervision. The tobacco sent to Mergui arrived too late, and the Deputy Commissioner is of opinion that the Sumatra variety would be more suitable.

39. English vegetable seeds were distributed to a large number of stations in Upper Burma and on the whole were fairly successful when grown by people who understood how to treat them. It was discovered in Sagaing that English vegetables of which there are indigenous varieties did not succeed on the island lands although the native variety flourished there.

Mergui experimental plantation.

40. No new clearings of Liberian coffee were made on the Mergui plantation so the area under this plant remained at 1·95 acres. During the year the coffee plants were attacked by a leaf disease which, however, by manuring the plants with burnt earth and ashes and sprinkling lime at the base of their stems was gradually subdued. The crop of the year amounted to 145·70 viss (3·65 *lb.*); of which 114 viss was sold for Rs. 334, a balance of 31·70 viss remaining unsold at the end of the year.

The Forest officer in charge says that it has been definitely established that coffee will grow in Mergui; the one question is whether it will pay to grow it and this in his opinion can only be determined by increasing the area under it to 20 acres, the area of the present plot being 1·95 acres.

The vanilla pods which were obtained last year, matured in August and September and were cured by a process devised by Mr. Ingram, Forest Officer. The curing was successfully accomplished as the pods were of a fine maroon colour and smelt very strongly of vanilla. Considerable difficulty, however, was experienced in drying them, and owing to persistent rain they became mildewed and their value much diminished. The Forest Officer is confident that, if mildew can be prevented from forming, the curing next year will be a decided success.

The vanilla obtained this year was sent to the Curator of the Kew Gardens for opinion; but, owing to the persistent rain and mildew having spoilt the drying process, it was not very favourably reported on. The cost of the plantation for the year was Rs. 593-14-5.

Agricultural shows.

41. Agricultural shows were held in the Tharrawaddy and Thôngwa districts in Lower Burma, and in Meiktila, Minbu, and the Upper Chindwin in Upper Burma.

The shows held at Letpadan and Danubyu were fairly successful, but the show at Letpadan was not so successful as the show held at Minhla in the same district last year. The reason assigned is that the Deputy Commissioner and thugyis were busily engaged with the census and had not time to widely advertise the show.

The show in the Upper Chindwin was held at Mingin and was a decided success, and the people are said to take a real interest in it. The show at Meiktila was held at Shweminyaw during the Pagoda festival. It was fairly successful, the show of cart-bullocks being particularly good and the ponies fair. Sufficient notice was not given to enable the people all over the district to learn that a show was to be held; hence the comparative ill-success.

The show at Minbu was a distinct failure, although the Deputy Commissioner says that it was widely advertised. The failure is attributed to the people having an idea that it was a deep laid scheme for increasing the taxes in some way or other.

SECTION VI.

Veterinary Establishments and Cattle-breeding.

42. The staff of Veterinary Assistants remained the same as last year. Nearly all of them worked well and are reported by District Officers to be rapidly gaining

the confidence of the people. The staff, however, is quite inadequate for the province, a large number of districts having no assistants at all. Although whenever possible an assistant is deputed from his own district to any other not possessing one in which there is an outbreak of cattle-disease, it often happens that no assistant is available, and during the year many applications for the services of an assistant had to be refused.

The supply of locally trained men is now exhausted and no more will be available till the first students are passed out of the Rangoon school which has been re-opened during the year. There are at present about 50 pupils in the school but Mr. Evans, the Veterinary Instructor, reports that the educational qualifications of many of them are not as high as could be desired. The services of a graduate of the Bombay Veterinary College were obtained during the year for the post of Assistant Veterinary Instructor, his duties being to lecture to the students of the school during Mr. Evans' absence on tour. He was appointed for six months on probation; this term is now complete and as he has passed the elementary standard in Burmese he will probably be confirmed.

43. Cattle-disease in Lower Burma was more fatal than in the previous year; the Veterinary Assistants treated a large number of cases and as a rule were very successful. A full account of the effects of cattle-disease in each district is given in Part I of the Revenue Report. More attention is now paid to the registration of cattle-deaths, and in districts in which there is a Land Records establishment the registers are systematically checked by its officers. The returns as a whole may be taken to be fairly accurate.

44. With regard to the question of the establishment of veterinary dispensaries in Burma referred to in Secretary to Government of India letter No. 505-12—2R., dated the 9th March 1891, it may be remarked that at the headquarters of each Veterinary Assistant at present there is practically a dispensary as he has a full stock of all necessary medicines and intruments. The only thing is that, owing to his being as a rule on tour, the dispensary is very often closed so that people are discouraged from resorting to it on the chance of finding the Veterinary Assistant there. The question of appointing two Veterinary Assistants to each district, one to be itinerant and the other stationary in charge of the dispensary, has been referred to District Officers, nearly all of whom are in favour of the establishment of a dispensary; the question being merely one of funds. The cost of the Veterinary Assistants at present entertained is borne by the District Cess Funds, and in most cases the cost of a second assistant if appointed will have to be borne by provincial revenues. The question of the establishment of dispensaries is now being considered.

45. During the year there were nine Government stallions and one Municipal stallion employed for stud purposes. Towards the end of the year two more were added, one was sent to Lashio and the other to Pyinmana. Two stallions died, one at Magwe from pneumonia and one at Mônywa from anthrax. The results of the horse-breeding operations during the year were fairly satisfactory, but the Veterinary Instructor points out that much more care should be exercised in the selection of mares. It has been decided to purchase a few Burman or Shan stallions instead of Arabs as hitherto; considerable difficulty has been experienced in getting suitable animals at reasonable prices, but the Veterinary Instructor managed to buy four colts in the Shan Hills and one in Lower Burma, and they are now in his charge at Rangoon.

Two stallion donkeys were obtained from India during the year, one has been sent to Lashio and the other to Meiktila. The Veterinary Instructor remarks:

"I think it would be advisable to buy two or three more. I see no reason why we should not be able to breed good mules fit for the Transport Department. The small Bhamo (Chinese) mules are most excellent little animals capable of any amount of work as are also the Panthè mules."

During the year a Code of Instructions prescribing the duties of the Veterinary Instructor has been drawn up and as an appendix to it a memorandum on the selection and management of grazing runs for the military police ponies in Upper Burma, the charge of the whole of the military police ponies having been declared to be part of the duties of the Veterinary Instructor.

SECTION VII.

Agricultural and Fiscal Statistics.

46. The weekly crop reports and monthly statements of rainfall have been submitted as usual and compiled in the office of the Director of Land Records. During the year standard rain-gauges of the Symons pattern were distributed to all stations which did not already possess them. There is nothing to add to what was said in last year's reports except that the rainfall returns are very often very carelesly compiled in the district offices and much unnecessary correspondence and reference is entailed in consequence. As an instance I may mention that in one case the rainfall of the district was given as the total of all the rainfalls registered at the various registering stations.

SECTION VIII.

Trade Statistics.

Trade registration.

47. The trade between Upper and Lower Burma by steamer and rail is compiled from returns furnished by the Irrawaddy Flotilla Company and the Burma State Railway and quarterly and annual reports on it are written. It is now under consideration to re-establish the old registering stations as Allanmyo and along the frontier from Allanmyo to Toungoo for the purpose of registering the boat trade and the traffic by cart across the frontier. It has also been proposed to register the inland trade of the town of Rangoon, and proposals are now being prepared; but the practical difficulties in the way of registering the boat trade especially appear to be very great. For the purpose of registering the trade of Burma with adjacent foreign countries there are three registering stations in the Bhamo district, one in Mandalay, one in Meiktila, three in Amherst, one in Tavoy, and three in Salween; and the figures for the timber floated down the Salween river are obtained from the Forest Department.

A triennial report is written on this frontier trade. This report was written last year; this year the prescribed statements with an explanatory note were published. Proposals have lately been made for a revision of the frontier trade registration establishments with a view to strengthening the staff at the stations where by actual experience it has been found that work is most heavy, the abolition of one or two stations where very little trade is registered being proposed.

Crop estimate.

48. In October, November, and December statements were published showing the estimated area of the land sown with paddy in the 10 chief rice-exporting districts of Lower Burma, and in January and February an estimate was given of the amount of cargo rice likely to be available for export. The final estimate made in February was that 1,253,000 tons of cargo rice would be available for export. From the monthly review of the rice trade statistics for the month of September published by Messrs. Bulloch Brothers it appears that the actual exports up to 30th September were 1,236,099 tons including shipments to Upper Burma. There are still small stocks in hand, so that it is probable that the estimate given of the available surplus will prove to be very nearly correct.

SECTION IX.

49. Mr. Hall held charge of the Department from beginning of the year to November, when he proceeded on furlough; Mr. Leeds from November to February, and for the rest of the year I was in charge.

Maung Po Bye, Superintendent of Land Records, Henzada, was given three months' privilege leave in July 1891, Maung Ba On, Probationer, being appointed to act for him. On the expiration of his leave Maung Po Bye is to revert to the regular line as owing to the state of his health he is unable to stand the exposure necessitated by the work of a Superintendent of Land Records.

T. C. WILSON,

The 19th October 1891.

Officiating Director of the Department of Land Records and Agriculture.

APPENDICES.

DEPARTMENT OF LAND RECORDS AND AGRICULTURE.

A.—*Area under Supplementary Survery and Cost of the Operations.*

1	2		3		4		5		6		7		8		9		
District.	Number of circles.		Total area in square miles.		Area assessed or held under temporary exemption. Paddy.		Garden and miscellaneous cultivation.		Total.		Actual cost of supplementary survey operations in		Cost per square mile of total area.		Cost per acre shown in column 6.		Remarks.
	1889-90.	1890-91.	1889-90.	1890-91.	1889-90.	1890-91.	1889-90.	1890-91.	1889-90.	1890-91.	1889-90.	1890-91.	1889-90.	1890-91.	1889-90.	1890-91.	
					Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs. A. P.	Rs. A. P.	Pies.	Pies.	
Pegu ...	37	37	2,018	2,018	743,401	763,385	11,472	12,122	754,873	775,507	17,369	16,190	8 9 9	8 0 4	4·42	4·01	
Hanthawaddy ...	34	35	1,409	1,476	443,878	466,414	32,391	33,900	476,269	500,314	17,756	14,184	12 9 8	9 9 9	7·16	5·44	
Tharrawaddy ...	25	25	1,096	1,096	313,897	317,098	12,357	12,836	326,254	329,934	10,811	12,245	9 13 10	11 2 9	6·36	7·13	
Prome ...	36	43	701	801	212,899	223,066	19,394	25,729	232,293	248,795	10,518	10,534	15 0 1	13 2 5	8·69	8·13	
Bassein ...	55	51	2,298	2,372	505,777	512,343	25,253	26,557	531,030	538,900	18,643	17,891	8 1 10	7 8 8	6·74	6·37	
Henzada ...	37	45	1,206	1,402	292,783	345,478	42,287	46,070	335,070	391,548	10,977	13,162	9 1 8	9 6 2	6·29	6·45	
Akyab ...	77	74	1,839	1,839	432,836	443,333	26,791	27,495	459,627	470,828	12,805	13,237	6 15 5	7 3 2	5·35	5·39	
Thôngwa ...	...	5	...	424	...	56,230	...	6,152	...	62,382	...	2,446	...	5 12 3	...	7·53	
Total ...	301	315	10,567	11,428	2,945,471	3,127,347	169,945	190,861	3,115,416	3,318,208	98,879	99,889	9 5 9	8 11 10	5·99	5·78	

Bassein.—Figures for 1890-91 exclude eight circles transferred to the Henzada district and includes four new circles brought under supplementry survey this year.
Henzada.—Figures for 1890-91 include eight circles transferred from Bassein district.

B.—*Assessments in the Tracts under Supplementary Survey.*

1	2		3		4		Remarks.
District.	Paddy-land.		Garden and miscellaneous.		Total.		
	1889-90.	1890-91.	1889-90.	1890-91.	1889-90.	1890-91.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Pegu	15,19,489*	15,45,036	25,056	25,950	15,44,545*	15,70,986	* Revised figures.
Hanthawaddy	10,39,382	10,75,021	83,293	83,389	11,22,675	11,58,410	
Tharrawaddy	5,29,808	5,50,164	27,307	28,535	5,57,115	5,78,699	
Prome	2,22,132	2,17,884	48,479	59,224	2,70,611	2,77,108	
Bassein	8,13,180	7,27,037	48,032	52,895	8,61,212	7,79,932	
Henzada	5,38,853	6,21,117	75,891	83,520	6,14,744	7,04,637	
Akyab	8,93,113	9,22,235	54,690	53,930	9,47,803	9,76,165	
Thôngwa	...	1,18,646	...	15,270	...	1,33,916	
Total ...	55,55,957	57,77,137	3,62,748	4,02,713	59,18,705	61,79,850	

C.—*Agency by which the Supplementary Survery was conducted.*

1	2	3	4	5.	6	7
District.	Number of circles.	Number of thugyis who have qualified in surveying.	Number of thugyis who actually took part in supplementary survey.	Number of circles in which thugyisayès were employed.	Number of circles in which it was necessary to employ two thugyisayès.	Remarks.
Pegu ...	37	30	37	35	8	
Hanthawaddy ...	35	26	...	34	...	
Tharrawaddy ...	25	10	6	25	19	
Prome ...	43	17	4	42	1	
Bassein ...	51	22	17	51	...	
Henzada ...	45	31	31	43	4	
Akyab ...	74	16	7	67	1	
Thôngwa ...	5	2	1	5	1	
Total ...	315	154	103	302	34	

D.—*Supplementary Survey Inspection.*

District.	Year.	Number of kwins in tract under supplementary survey.	Number of kwins in which the field work was checked by the Superintendent.	Work done by Inspectors.			Total number of kwins, the field work of which was checked by Land Records staff.	Number of kwins, the field work of which was checked by the Deputy Commissioner.	Work done by Sub-divisional Officers.			Work done by Township Officers.		
				Number of Inspectors.	Number of kwins checked.	Average.			Number of Sub-divisional Officers.	Number of kwins checked.	Average.	Number of Township Officers.	Number of kwins checked.	Average.
Pegu	1889-90	917	61	4	269	67	317	23	2	19	9	5	53	
	1890-91	917	62	4	375	94	425	5	1	13	13	5	40	8
Hanthawaddy	1889-90	917	59	4	290	72	349	36	1	7	7	4	28	7
	1890-91	1,003	95	4	459	115	504	46	1	6	6	4	41	10
Tharrawaddy	1889-90	449	57	4	187	47	244	14	1	...	...	4	39	10
	1890-91	449	76	4	206	51	282	8	2	17	8	5	11	2
Prome	1889-90	365	82	3	178	59	260	4	3	23	8	5	9	2
	1890-91	465	80	3	245	82	325	2	1	2	2	4	15	4
Bassein	1889-90	1,241	63	7	268	38	317	14	2	27	13	8	88	11
	1890-91	1,202	112	7	543*	78	571	31	4	4	1	8	53	7
Henzada	1889-90	468	59	5	218	44	277	21	2	16	8	5	46	9
	1890-91	636	56	5	322	64	350	16	4	39	10	6	75	12
Akyab	1889-90	1,005	49	5	429	86	478	11	2	7	3	8	8	1
	1890-91	1,010	57	5	476	95	533	6	3	16	5	5	37	7
Thôngwa	1889-90	...	...	...	...	...	...	...	...	...	...	...	...	...
	1890-91	...	66	...	...	...	...	2	1	4	4	1	7	7
Total	1889-90	5,262	430	32	1,839	57	2,242	123	13	99	8	39	270	7
	1890-91	5,672	604	32	2,626	82	2,990	116	17	101	6	38	279	7

* Exclusive of 29 kwins tested in Lemyethna township before it was transferred to Henzada.

E.—*Result of Corrections.*

District.	Effect of correction.							
	Total increase.		*Total decrease.*		*Net increase.*		*Net decrease.*	
	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.
1	2	3	4	5	6	7	8	9
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Pegu	369	968	168	776	201	192	...	...
Hanthawaddy ...	354	813	201	454	153	359	...	...
Tharrawaddy ...	326	1,079	44	104	282	975	...	...
Prome	213	291	33	176	180	115	...	...
Bassein	549	1,162	422	1,138	127	24	...	...
Henzada	354	834	10	386	344	448	...	...
Akyab	509	1,341	115	478	394	863	...	...
Thôngwa ...	9	20	...	...	9	20	...	...
Total ...	2,683	6,508	993	3,512	1,690	2,996	...	...

F.—*Tables showing the nature of errors found by the Superintendents and Inspectors.*

(*a*) New plots wrongly surveyed.

District.	Number of new fields or plots checked by Superintendent or Inspector.	Number of such plots in which errors were found.			Remarks.
		Errors amounting to half an acre or more.	Errors of less than half an acre.	Total number of errors.	
1	2	3	4	5	6
Pegu ...	3,271	29	180	209	
Hanthawaddy ...	1,159	39	139	178	
Tharrawaddy ...	1,854	108	625	733	
Prome ...	306	49	50	99	
Bassein ...	768	48	212	260	
Henzada ...	2,549	66	281	347	
Akyab ...	2,280	32	199	231	
Thôngwa ...	...	...	...	...	
Total ...	12,187	371	1,686	2,057	

(*b*) Omissions to survey new plots.

District.	Number of new plots found not surveyed.			Remarks.
	Errors amounting to half an acre or more.	Errors of less than half an acre.	Total number of errors.	
1	2	3	4	5
Pegu	29	619	648	
Hanthawaddy	...	...	...	
Tharrawaddy	95	492	587	
Prome	29	165	194	
Bassein	186	943	1,129	
Henzada	93	507	600	
Akyab	123	865	988	
Thôngwa	9	...	9	
Total ...	564	3,591	4,155	

F.—*Table showing the nature of the errors found by the Superintendents and Inspectors* —continued.

(*c*) Errors in marking fallows.

District.	Number of fields marked fallow that were checked.	Fallow fields shown as cultivated.			Cultivated fields shown as fallows.			Remarks.
		Errors amounting to half an acre or more.	Errors of less than half an acre.	Total number of errors.	Errors amounting to half an acre or more.	Errors of less than half an acre.	Total number of errors.	
1	2	3	4	5	6	7	8	9
Pegu	12,413	67	552	619	25	59	84	
Hanthawaddy ...	10,606	149	612	761	72	137	209	
Tharrawaddy ...	22,725	94	1,147	1,241	17	219	236	
Prome	10,056	111	1,432	1,543	8	197	205	
Bassein	44,816	681	3,380	4,061	258	1,175	1,433	
Henzada	8,784	157	1,447	1,604	100	561	661	
Akyab	37,389	97	2,613	2,710	18	342	360	
Thôngwa	103	38	...	38	8	...	8	
Total ...	146,892	1,394	11,183	12,577	506	2,690	3,196	

(*d*) Lands wrongly classified and errors in field boundaries in the interior of holdings.

District.	Classification of land.		Interior holding boundary errors.		Remarks.
	Number of holdings visited.	Number of holdings in which land was found wrongly classified.	Number of boundaries checked.	Number of boundaries in which errors were found.	
1	2	3	4	5	6
Pegu	4,491	44	5,010	39	
Hanthawaddy ...	6,699	54	6,699	48	
Tharrawaddy ...	7,165	72	40,206	4,138	
Prome	1,656	34	3,947	164	
Bassein	4,971	87	6,505	630	
Henzada	9,567	385	124,745	3,487	
Akyab	3,108	24	20,765	329	
Thôngwa	1	...	8	23	
Total ...	37,658	700	207,885	8,908	

F.—*Table showing the nature of the errors found by the Superintendents and Inspectors* —concluded.

(*e*) Errors in noting sales, transfers, and sub-letting of land.

District.	Tenant statistics.		Statistics of sales, transfers, mortgages, &c.		Kazin errors.		Others.	
	Number of cases of sub-letting checked.	Omissions to note, or errors in showing tenancies.	Number of cases in which sales, transfers, and mortgages were checked.	Omissions to show, or errors in noting terms of sales, transfers, and mortgages.	Number of fields checked.	Number of errors.	Number of fields checked.	Number of errors.
1	2	3	4	5	6	7	8	9
Pegu	3,031	249	1,980	85	69,056	1,807	2,035	411
Hanthawaddy ...	1,374	243	519	143	90,721	585	...	127
Tharrawaddy ...	1,954	428	896	269	...	...	...	...
Prome	1,666	243	1,777	151	...	706	...	121
Bassein	1,420	216	329	51	123,199	3,961	9,217	214
Henzada	2,869	420	727	91	...	...	5,437	5,363
Akyab	1,711	412	633	127	322,359	3,129	1,932	328
Thôngwa	4	15	...	...	...	...	...	...
Total ...	14,029	2,226	6,861	917	605,335	10,188	18,621	6,564

G.—*Condition of the permanent Survey-marks.*

District.	Total number of permanent survey-marks in the district.	Number of marks visited by thugyis and taliksayôs.	Number of marks.		Number of marks.		Remarks.
			Found broken.	Replaced.	Missing.	Replaced.	
1	2	3	4	5	6	7	8
Pegu	12,122	5,882	620	558	1,454	1,364	
Hanthawaddy ...	12,985	4,159	907	799	526	382	
Tharrawaddy ...	9,090	4,860	881	881	607	465	
Prome	9,957	...	753	377	643	328	
Bassein	22,024	8,531	1,004	1,004	2,070	2,070	
Henzada ...	20,191	12,202	1,444	1,294	2,064	1,576	
Akyab	11,106	6,879	560	560	485	368	
Thôngwa ...	5,520	3,375	27	21	8	2	
Total ...	102,995	45,888	6,196	5,494	7,797	6,555	

H.—*Thugyis' commission and Thugyis' Assistants' Salaries.*

District.	Number of thugyis.	Year.	Total area assessed or held under temporary exemption.	Thugyis' commission: On land revenue.	Thugyis' commission: On capitation-tax and other taxes or rates.	Thugyis' commission: Total.	Deductions made from thugyis' commission: For thugyisayès: Number.	Deductions made from thugyis' commission: For thugyisayès: Amount per annum.	Deductions made from thugyis' commission: Chaimmen.	Deductions made from thugyis' commission: Total.	Balance paid to thugyis.	Remarks.
			Acres.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	
Pegu	37	1889-90	754,873	83,949	24,501	1,08,450	49	17,773	2,774	20,547	87,903	
	38	1890-91	775,507	79,651	25,734	1,05,385	44	17,803	2,726	20,529	84,856	
Hanthawaddy	34	1889-90	476,269	57,055	22,433	79,488	38	13,045	...	13,045	66,443	
	35	1890-91	500,314	59,664	22,345	82,009	34	14,703	...	14,703	67,306	
Tharrawaddy	25	1889-90	326,254	32,075	18,905	50,980	40	12,598	4,671	17,269	33,711	
	25	1890-91	329,934	28,044	20,685	48,729	42	14,123	2,902	17,025	31,704	
Prome	36	1889-90	232,293	15,197	21,360	36,557	26	10,308	2,663	12,971	23,586	
	49	1890-91	248,795	15,726	23,717	39,443	31	10,717	2,505	13,222	26,221	
Bassein	34	1889-90	531,030	49,554	25,136	74,690	51	33,660	...	33,660	41,030	
	34	1890-91	538,900	45,034	23,363	68,397	51	19,620	8,778*	28,398	39,999	
Henzada...	37	1889-90	335,070	31,113	28,736	59,849	31	11,674	2,045	13,719	46,130	
	41	1890-91	391,548	33,179	30,617	63,796	36	11,754	2,904	14,658	49,138	
Akyab	77	1889-90	459,627	57,790	29,752	87,542	52	21,681	2,805	24,486	63,056	
	74	1890-91	470,828	58,259	30,148	88,407	51	22,024	3,076	25,100	63,307	
Thôngwa	...	1889-90	...	...	...	...	...	...	...	...	...	
	5	1890-91	62,382	6,949	4,008	10,957	5	1,270	396	1,666	9,291	
Total ...	280	1889-90	3,115,416	3,26,733	1,70,823	4,97,556	287	1,20,739	14,958	1,35,697	3,61,859	
	301	1890-91	3,318,208	3,26,506	1,80,617	5,07,123	294	1,12,014	23,287	1,35,301	3,71,822	

* Includes Rs. 1,434 pay of extra taiksayès.

1.—*Survey Examinations in Lower Burma.*

District.	Number of candidates who passed in				Remarks.
	October 1890.		April 1891.		
	From Government Survey schools.	From other schools or private students.	From Government Survey schools.	From other schools or private students.	
1	2	3	4	5	6
Akyab	8	1	1	4	
Kyaukpyu	1	1	1	...	
Sandoway	...	...	3	...	
Rangoon	...	4	...	...	
Hanthawaddy	...	3	...	6	
Pegu	3	3	3	5	
Tharrawaddy	...	2	2	1	
Prome	...	...	3	...	
Bassein	...	2	5	...	
Thôngwa	...	2	3	2	
Henzada	4	2	5	3	
Thayetmyo	...	...	...	1	
Amherst (Moulmein)	6	...	1	...	
Shwegyin	...	2	...	1	
Toungoo	...	5	...	3	
Total ...	22	27	27	23	

Total number of candidates passed—

June 1887	29
October 1887	26
June 1888	96
October 1888	101
June 1889	122
October 1889	80
April 1890	100
October 1890	49
April 1891	50

c

ROYAL ASIATIC SOCIETY OF THE BENGAL

REPORT ON THE OPERATIONS OF THE LOWER BURMA FIELD-TO-FIELD SURVEY BY LOCAL AGENCY PARTY FOR THE YEAR 1890-91.

Last year's recess-work.

ALL the recess-work, with the exception of some 2-inch reductions, appertaining to the survey executed during the previous open season, was completed by the end of November last. This consisted of the inking-in, numbering, printing, and typing of the 16-inch maps, the preparation of the area statements in duplicate, the completion of the registers and first year's maps for supplementary survey offices, the writing up of the usual abstracts and indexes for the office, the reduction of the maps to the 2-inch scale, and the preparing of the 16-inch and 2-inch maps for lithography. The work was very heavy, and in order to finish it in time the whole of the hands had to work out of office hours almost throughout the recess months. The drawing of the 2-inch reductions previously referred to was finished early in April.

Supplementary Survey of tracts surveyed field-to-field last year.

2. In work performed by the regular cadastral survey and settlement parties, the practice ordinarily is as follows :—

in the first year the country to be operated on is traversed ;
in the second year the cadastral survey is completed ;
in the third year the settlement investigations take place, with traces furnished by the cadastral party ;
in the fourth year the published 16-inch maps reach the local authorities from Calcutta,

and in the fifth year the supplementary survey begins.

In the 284 square miles of country completed in the Hanthawaddy, Prome, and Bassein districts by the Lower Burma field-to-field survey party last year, the traverse work (by No. 12, Survey of India party), the field-to-field work, the settlement traces, settlement registers, 16-inch published sheets, and the preliminary entries on the first year's supplementary survey maps, were all completed by the 30th November 1890. Such being the case, it was suggested that the supplementary survey work for these tracts be begun immediately, as there was nothing to be gained by any delay in this respect, since the rates on land would not vary (owing to the conclusion come to in paragraph 24 of the Land Records Department Report for 1889-90); so that there would be no necessity for the postponement for one year of the application of the rates which would have had to have been done under the revenue rules in case it was proposed to enhance the rates. It was manifest also that it would be a distinct gain to the State to have the current rates applied to the correct areas as early as possible. These suggestions were approved of by the Financial Commissioner who ordered that in case the Commissioners of Pegu and Irrawaddy could see their way to giving effect to the proposals, that the supplementary survey of the tracts, in the districts named, which were surveyed by local agency in 1889-90, should be commenced in 1890-91. In accordance with these orders the requisite settlement traces, holding registers, area statements, and published 16-inch maps with the holdings, &c., marked thereon in pencil for the first year's supplementary survey work, were forwarded direct to the Deputy Commissioners concerned on the 18th December 1890. Owing to local difficulties, however, it was not found convenient to start the supplementary survey for the first year in the Bassein district, although in Hanthawaddy and Prome this work was successfully accomplished. In Bassein the supplementary survey of the tracts surveyed in 1889-90 will be commenced next year.

With respect to the tracts surveyed in detail by local agency this year, it is hoped that notwithstanding the inordinately heavy character of the work, owing to the large extent of country surveyed, the necessary records will be quite ready by the end of the current recess season, in case it is decided to begin the supplementary survey for these areas also, in the first year after survey, namely, in the ensuing field season. The cost of the preparation of these records (including the cost incurred in connection with certain holding and other surveys) will amount in all to Rs. 4,500.

Preliminary arrangements.

3. It having been decided to complete the survey field-to-field of as large an area as possible this year, arrangements were made for organizing a party of the full working strength, composed of 90 field surveyors and others. As compared with No. 7 Party of the Survey of India Department, which operated in the Thôngwa district in 1889-80 with 120 field surveyors, the local party cannot be said to have been abnormally strong. Several of the Burman field surveyors who had worked in the local field-to-field survey office during the previous field season, and who had been provided with leave certificates, carrying certain leave pay with them, failed to return to work at the conclusion of last recess season. This was due partly as the result of fear owing to the unusually heavy sickness that prevailed in the camps last field season, but chiefly to the fact of the men having found work in more remunerative and more congenial appointments as thugyi-sayès and other similar posts. There was not the same difficulty, however, as was experienced in the previous season, in securing the services of men possessing the requisite certificates of qualification in surveying,

as there are now a large number of passes at the half-yearly thugyiship examinations which help to provide indigenous surveyors to the province. In addition to men of this stamp who were entertained, 17 Burman field surveyors from No. 7 Party, who were working there under Mr. Bridges's 5-years' scheme, were taken over temporarily, with the approval of the Chief Commissioner, as owing to a limited budget employment could not be found for them by the officer in charge under whom they had been serving. Including the hands that had worked during the recess season, the following appointments were made for the work of the field season, with effect from the 1st December 1890, the date on which it was decided to start field work, namely, 9 inspectors, 90 field surveyors, and 25 clerks, draughtsmen, holding markers, tracers, &c. Besides these 450 menials were found work as tindals, messengers, chainmen, &c. Among the field surveyors there were six Hindustanis out of the eight who had worked the previous season. Three of these did fairly well, but the others worked indifferently. There were a great number of Hindustani applicants for work as field surveyors this year, but as experience had shown that this class of men proved rather a failure, as compared with their Burman *confreres*, when serving under the immediate orders of Burman Myoôks and Inspectors, no more than the six who had been previously promised work were entertained.

Taking the field.

4. Three detachments were again formed this year : one in charge of Myoôk Maung San Dun, which was to work in the Hanthawaddy and Tharrawaddy districts, a second in charge of Myoôk Maung Pyu Than for the Prome dirtrict, and the third under Myoôk Maung Tun for work in the Bassein and Henzada districts. All three of these were fully equipped, and having a sufficiency of 16-inch plots in hand to keep them amply occupied for the space of about two months, were despatched to their respective destinations at Tawlate, Kani, and Padaung, Nos 1 and 3 on the forenoon of the 1st December and No. 2 on the afternoon of the 30th November.

System of payment to field surveyors and others.

5. There was no alteration in the system of payments previously adopted. Inspectors were paid at fixed monthly salaries of Rs. 40 to Rs. 80, and they got in addition a fixed travelling allowance for the time they were out in the field calculated at Rs. 20 each per mensem. Field surveyors were paid at contract rates, according to the class of work done, fields or topographical features, and its quality. They received advances on account, however, of Rs. 20 or less, where considered necessary, per mensem, which were deducted from their total earnings at the end of the field season. Deserving field surveyors were found work during the recess on fixed salaries as draughtsmen, computers, &c. Messengers and tindals received Rs. 14 per mensem and khalassies Rs. 12. Field surveyors were required to find their own chainmen, but as a matter of fact about half the required number had to be engaged for them. About one-third of the khalassis were inhabitants of the soil, and the remainder Hindustanis; they were taken on locally at Rangoon, Talwatè, Prome, Myanaung, and elsewhere. Next season it may not be possible to get all the men required in Burma, owing to a larger establishment that will be required for the traverse section of the year's work, so that some arrangement will have to be entered into for getting part of the required number from Hazaribagh (India) by payment of their steamer fares to and from Burma and fixing the pay of such men at a lower rate of Rs. 10, just as is the practice in Survey of India parties.

Commencement of field work and training of hands.

6. Field work was started immediately on the arrival of the camp officers at their respective centres of work. In the Hanthawaddy district the circles of Bawle and Aingkalaung (both of which are said to be subject to floods) were first commenced by Camp No. 1, but owing to their being basin-like in formation they were yet under water except towards the edges, where the ground was higher and where therefore the survey work was in the earlier parts of the season confined. The survey of Myaungtaga circle was not undertaken till a littlè later on in the year owing to there being too much fever prevalent on the Taikgyi side, of which the party had a sad experience the year befere, to permit of it. All the available plots of this side having been completed, the camp was shifted to Teindaw on the 23rd February as some of the new plots of the Tharrawaddy district were promised here shortly. The little work that there was on this side having also been finished, the camp was again shifted to Tharawaw on the 16th March, where the whole of Hlèzeik circle was surveyed, partly on the triangulation system (to be described hereafter) and partly on traverse plots. It may be mentioned here *en passant* that six kwins in the Tharrawaddy district which were intended to be excluded from survey were erroneously traversed, but as the plots were supplied to Maung San Dun they were worked upon by the detail survey. From here this camp removed finally to Pogaung on the 9th May to complete the balance of the work in the Aingkalaung and Bawlè circles, and thence came into Rangoon, after closing field operations, on the 7th June. Camp No. 2 was throughout the season employed in the Prome district. It started work in the Padaung township, and after finishing the areas that were allotted to it for survey there removed into the Mahathaman township on the 3rd May, although some squads were sent in advance so early as the 22nd March. This camp arrived at Rangoon, after closing field work here, on the 14th

June. Camp No. 3 was despatched to the Myaungmya subdivision of the Bassein district, to complete the survey of portions of five circles of which the traverse plots were remaining over from the previous season's work, it having been decided for No. 12 Party not to continue the traverse survey in this district any longer, but to complete the areas originally sketched out for survey by it in the remaining four districts only. Having finished the work of the Bassein district this camp was marched overland across to Myanaung *viâ* Bassein, Kyonpyaw and Henzada, in order to commence the survey in the Henzada district. Here certain delays arose, which will be explained hereafter, in the receipt of traverse plots, and work was seriously impeded; but notwithstanding this, the survey of the circles in this part, with the adoption of the triangulation system of survey, was completed on the 10th May and the camp removed on the 13th idem to Zalun to finish Yin-e circle. The whole of the tracts for detail survey by local agency in the Henzada district having been done, this camp closed field work and came into Rangoon on the 15th June. The Myoôks and Inspectors did a good deal in the training of their raw hands, of whom they had a large number, especially in the matter of surveying topographical features and undulating ground of which there was a considerable area both in Prome and Henzada. In the survey of hilly country, the contour lines were marked at 10 feet vertical intervals, just as was adopted last year. At the commencement of operations several sheets completed by the new hands had to be rejected and re-done, but as the season advanced better results were forthcoming from all round. Owing to this cause and also to the fact of the paddy in the fields being in process of being reaped survey work at the start progressed somewhat slowly, although later on it was executed with surprising rapidity due to the comparative freedom from sickness enjoyed by all the camps this year.

Delays in receipt of traverse plots and result thereof.

7. There were serious delays in the receipt of traverse plots this year also. It was hoped that by the 1st of February at the very latest the requisite supply of plots would have been received by all three camps, but, with the exception of Camp No. 2, the other camps were disappointed in this respect, resulting in the enforced idleness of 56 field surveyors on an average of 28 days each. Some help in the plotting of sheets was afforded by Camps 1 and 3 to the corresponding traverse camps, but when it was found that the promises held out to Myoôks Maung San Dun and Maung Tun, about the early and sufficient supply of sheets were not being fulfilled and that up to the 11th of March only 93 sheets of the Henzada district and 47 sheets of the Tharrawaddy district, appertaining to 64 kwins in all, only were received,—this short and irregular supply frequently necessitating two surveyors being put on to the same sheet—steps were advocated for the prosecution of the survey on the triangulation system without the aid of plots. Had any clue been given as to the approximate times at which traverse plots might have been expected to have been received during the field season from the traverse party such as was asked for, the loss in time and money which has been occasioned would perhaps have been avoided, as also the voluminous correspondence that followed on the subject of the late receipt of these plots. The importance of a regular and sufficient supply of sheets to the field-to-field camps was frequently pointed out to the officers responsible for the traverse work.

Survey on the triangulation system.

8. Finding that the members of Camps Nos. 1 and 3 were being idle for want of traverse plots, and that such plots were not being furnished in proper time, regularly, or in sufficient numbers, representations on the subject were made and the orders of the Financial Commissioner and Director obtained on the 27th of March for the prosecution of work on the triangulation system without the aid of plots. This system consisted of doing the detailed survey work in a kwin of which the plots had not been received, based on a series of carefully measured and well-connected triangles, which were to be linked on at once or afterwards, according as pipes denoting the positions of the theodolite survey stations were already found on the ground or not to the traverse points. Written instructions were accordingly prepared, describing the system to be followed in detail, and Mr. D. Hardinge, Myoôk in charge of the map section, was sent with these to all three Camp Officers, to whom he was besides personally to explain the methods they were to pursue in this regard. This triangulation system was also subsequently taught to the Camp Officers by the Superintendent on his visits of inspection to their camps. Necessity, however, only arose for applying the above system in the three districts of Henzada, Tharrawaddy, and Hanthawaddy. In Camp No. 1 these orders received effect from the 1st April and in Camp No. 3 from the 7th of the same month. All this has of course materially enhanced the cost of operations, firstly, in the enforced idleness for nearly a month of two whole camps; secondly, in the extra time taken for the survey of a kwin, in the selecting, measuring, and laying-out of the triangles on the ground; and, thirdly, in the additional labour of inking up such sheets and copying them afresh on the 16-inch plots which were subsequently received from the traverse party. The introduction of the triangulation system has, however, saved the local agency party from what might have proved to have been a much more serious loss than that already experienced. A total of 97 kwins, comprising an area of 197 square miles, was surveyed by the triangulation method. Some of the traverse plots relating to Yin-e circle of the Henzada district and to the Aingkalaung

and Bawlè circles of the Hanthawaddy district are yet due, but it is hoped that these will soon be supplied to enable the detail work executed on the triangulation system to be plotted thereon on an early date.

Tracts surveyed last year, those surveyed this year, and those remaining for survey.

9. The areas, in square miles, of these various tracts, see map (A), for each of the eight districts named below are approximately as under.

District.	Excluded area.	Area surveyed in 1889-90.	Area surveyed in 1890-91.	Area for survey.	Total area.	Remarks.
	Sqr. miles.	Sqr. miles.	Sqr. miles.	Sqr. miles.	Sqr. miles.	
Hanthawaddy	...	67·41	340·85	...	408·26	
Henzada ...	19·30	...	416·81*	...	436·11	* By Camp No. 1, 61·82. By Camp No. 8, 354·99.
Tharrawaddy	24·32	...	126·25	...	150·57	
Prome ...	439·68	111·08	488 50	361·41	1,395·62	
Bassein ...	651·60	105·52	73·12	658·16	1,488·40	
Thôngwa ...	...	...	...	109·00	109·00	Recently proposed for survey.
Thayetmyo ...	...	...	...	300·00	300·00	Approximate area.
Kyaukpyu ...	...	...	...	786·00	786·00	
Sandoway ...	...	...	...	800·00	800·00	Approximate area not yet formally proposed for survey.
Total ...	1,134·90	283·96	1,446·53	2,514·57	5,373·96	

These figures are in accordance with the Survey Conference programmes of 1889 and 1891. As the cadastral survey in the Tavoy and Mergui districts of about 1,000 square miles of country is according to the latter programme to be undertaken by No. 7 Party, which is at present working in the adjoining district of Moulmein, all the records relating to the work of these districts which were received from No. 13 Party last year have been handed over to the officer in charge No. 7 Party. The area of 109 square miles of the Thôngwa district was only recently proposed for survey by the Commissioner, and as No. 7 Party is now no longer employed in that district the work is to be done by the local agency party next year. In regard to the area for Sandoway district, the better cultivated tracts have already been surveyed within the past two years by a special holding survey, and the increased areas resulting from such survey have already been assessed upon; but it has been decided to discontinue these holding surveys in the future and also the annual supplementary surveys based upon such measurements. I think it would be worth while to survey the same areas field-to-field and thus provide reliable 16-inch maps by the aid of which the annual supplementary surveys could be accurately conducted and so as to give stability to the future annual assessments. There would not be much gain, if any, in point of money by the execution of such a survey, following as it would in the footsteps of the holding survey, unless it was in the result of a settlement which the Deputy Commissioner of Sandoway has been advocating, but yet there would be indirect advantages which must accrue, such as the carefully following up of the annual extensions, the furnishing of correct areas of fallow and of lands which may form the subject of remissions, &c.

Of the 1,441 square miles surveyed in detail by local agency this year, 434 square miles were completed on the plots in hand at the beginning of the field season (namely, of 64 miles of which plots remained over from last field-season, and of 370 miles received during last recess), 810 square miles on the plots furnished during the field season, and 197 square miles according to the triangulation system. In the Hanthawaddy district the balance of Myaungtaga circle, which was surveyed in part last year, was completed this year and the whole of the circles of Bawlè and Myaungtaga. In the Henzada district the circles of Paye, Alôn, Myaunggyi, Theingôn, Myinwataung, Nyaungywangè, Hièzeik, Yin-e, Sibin, and Nyaungywagyi were completely surveyed, also two small islands of Apyauk circle which were surveyed previously, but which it was considered advisable to re-survey on plots furnished by the traverse camp owing to the changes in the aspect of the land since the last survey having become so great as to necessitate a republication of the maps relating to them. In the Tharrawaddy district Tharawaw and Teindaw circles were done. In the Prome district the following circles were wholly surveyed, namely, Kyaungu, Tayôkpin, Kyaukpu, Kyundaing, Leywa, Pyinmana, Pyingyi, Taungza, Kya-o, Thyetmyaung (15), Ywathitgyi, Lèmigô, Minngègôn and Katheinga, and the following only in part, namely, Sèhnitywa (complete), Alodawya (incomplete), Leyèdat (complete), Leywa (complete), Myogwin (complete), Sindè (complete), Okshittaung (incomplete), and Paukkaung or Shwele (incomplete). In the Bassein district the following circles were

only partly surveyed, namely, Kwinbaukgyi (incomplete), Lébyauk (incomplete), Kyagan (incomplete), Kanni (complete), and Thamandewa (incomplete).

Traverse and detail survey by local agency next year.

10. Owing to the transfer of No. 12 Party to Upper Burma it has been decided, according to the survey programme of 1891, that the areas shown as fit for survey in the table given in the preceding paragraph are to be both traversed and surveyed in detail by the local agency party. In this view work can be found for this party to fully occupy it for the next two years only, after which it will have to be disbanded, when the members can be found suitable employment elsewhere. There is an area of 361 square miles remaining for survey in the Prome district. Most of this, with the exception of three or four small kwins situated at the base of the hills on the east of the district, has, I understand, been already traversed by No. 12 Party. The plots relating to this area will no doubt, after the revisions which have yet to be done are finished, be handed over in full sufficiently early next season to enable the detail survey camp to take it up. So that the local agency traverse camps need not concern themselves about this district at all, unless it is found that the cultivation in the three or four kwins referred to is so extensive as to justify the expenditure of sending out a special squad to traverse it. There would thus remain the districts of Bassein, Thôngwa, and Thayetmyo for traverse survey next season, together with the detail survey of these districts in addition to Prome. For this purpose it is proposed to form two traverse camps and two field-to-field camps, one traverse camp to do Bassein and the other Thayetmyo and Thôngwa, while one field-to-field camp could take up Prome and Thayetmyo and the second Bassein and Thôngwa. The area for traverse survey would thus equal 1,067 square miles and for detail survey 1,428 square miles. In the year following, the traverse and detail survey could take up and complete the 1,086 square miles proposed for survey in the Kyaukpyu and Sandoway districts.

Health of detachments.

11. The health of the entire party during the year was on the whole satisfactory. There were four casualties, I regret to say, amongst the field surveyors, and no others. All four succumbed after a short illness in each case, to attacks of a malarious fever contracted while surveying out in the jungle; one was attached to Camp No. 1, another to Camp No. 2, and two to Camp No. 3. Two out of the four were men who belonged to No. 7 Party, who were working under the five years' scheme. The members of Camp No. 3 suffered a good deal from fever and dysentery while working in the jungles at the foot of the Yoma range of hills in the Bassein district, but there were no deaths. In parts of Henzada also, towards the hills in the north-west of the district, fever was prevalent amongst the men to a greater or less extent. In Camp No. 2 also there was much sickness from fever near the hills on the Padaung side, one of the Inspectors being incapacitated owing to this cause for a considerable time. Camp No. 1 was comparatively free from sickness, having had more than its share of it the year previous when working on the Taikgyi side; the Myoôk of this camp was bad with sore-eyes for the space of about a month. A supply of medicines was obtained on indent from the Medical Stores before the taking of the field, but these, owing to the heavy sickness that prevailed amongst the men in the earlier part of the season, proved inadequate for the requirements of the party. Under these circumstances it also became necessary to purchase for immediate requirements, the matter being one of urgency, a small supply from the local market at a cost of Rs. 41-8-0. The bill from the Medical Stores amounted to Rs. 143-5-9.

Demarcation of gardens, &c.

12. The Deputy Commissioners of the districts which were to be operated on by the Lower Burma Field-to-field Survey this year were again addressed by the Director to cause the necessary demarcation of gardens, orchards, burial-grounds, roads, monastery, pagodas, and school lands and village-sites to be done in accordance with the boundary rules. This work was better attended to this year; still it was found that a good deal of the demarcation work had to be done by or under the supervision of the Camp Officers and Field Surveyors themselves. In the Henzada district such demarcation was totally neglected in the circles of Myondaing and Nyaungywangé, and on the matter being brought to the notice of the Deputy Commissioner the thugyis in fault were punished.

Destruction to permanent survey marks.

13. There was considerable destruction to pipes used as survey marks again practised this year. This has been the general complaint. In one case in the Prome district, which occurred in the Paukkaung circle, it was found that out of 150 permanent survey marks imbedded by the traverse survey party, about one-fourth of the number were damaged or broken and a tenth completely removed. I came across this state of things frequently myself, and the Myoôks and others report the same condition of affairs. Of course it cannot be said that there is wholesale destruction everywhere in districts where surveys have been recently done as well as those completed some years ago, but there can be no doubt that wilful destruction of the clay pipes (which mark our permanent survey stations) is carried on more or less in all districts in which surveys have entered. The experience of Superintendents of Land Records everywhere points to the same condition of things in their respective districts. The pipes usually found to be broken or missing are those

situated near to villages or by public roads and in grazing-grounds. In the two cases last named, carts and cattle would perhaps in most instances be found to have been the cause of the destruction, but in the first one it will usually be found that some idle and mischievous villagers are to blame. It would undoubtedly be difficult to trace guilt in this respect to the real culprits, for a ywathugyi or thugyi could not very well be expected to watch over the welfare of every solitary mark, nor would it be right of them to do what a Karen ywauthgyi of the Bassein district is once said to have done, namely, to dig up all the marks and place them with great care under his own house. Yet some stringent measures in the matter of the preservation of these marks appear to be called for as it is of the utmost importance that all the permanent survey station marks should be carefully looked after and preserved all over the country.

Size of kwins.

14. The proper size of good workable kwins is from about 1 to 2 square miles, so that the detailed work can be conveniently fitted into one or two sheets of the standard size. The idea of confining the areas of kwins to about a square mile or so, is for the convenience of the annual supplementary survey which follows in the footsteps of the regular survey and settlement. For all larger kwins, which, at the time of demarcation, could not for any cause be cut up into smaller ones of the required size the work of subdividing these devolved upon the traverse survey party and Rule 7 of the "Directions to Demarcation Officers" provides for such duty being delegated to the officer in charge of the advance survey.

Duration of field season.

15. The field season, which consisted of 6½ months, began on the 1st December 1890 and ended on the 15th June 1891, or about half-a-month later than it was intended to close out-door operations. This was due to the late setting in of the rains this year, and as this was anticipated Camp Officers were instructed to continue field work till such time as the rains fairly broke upon them. This arrangement helped to add considerably to the outturn in area of the year, and compensated, too, in some measure, for the serious loss, both in time and money, which most of the field surveyors experienced when they could not be provided with plots for their work. The necessary sanction was accordingly obtained for the continuance of the expenditure of the party at its field strength up to the 15th June 1891. This plan, it was represented, would not entail any further outlay outside of the sanctioned budget allotment for the year, as there would be savings from several sources (inclusive of the saving that would result from the non-entertainment of the recess season establishment from the 1st to the 15th June 1891) which would meet the increased cost due to the prolongation of the field season's term.

Paying off of establishment.

16. On their return to headquarters all the purely field hands were paid the balance of their wages, the field surveyors getting what was due to them in accordance with their contract rates of payment by results. Those of the field surveyors who showed an aptitude for drawing and had otherwise deserved well in doing good work during the field season were found employment in the office for the recess.

Moneys earned according to the scale of contract charges (B).

17. The work of the field surveyors for the purposes of the table of rates was divided, like last year, into three classes, namely:—

I class, signifying agreement like a trace.
II class, work that was generally out 10 or 15 links.
III class, work that had to be rejected.

Payments were made for work of the first two classes only, the rates for these being in the proportion of 5 to 4. In working out the calculation, the average size of the field was also considered, this forming an important factor in the determination of the rates. Topographical and other features surveyed were paid for at distinct rates, according to class of work done, first or second, and were nearly one-half of those allowed the previous year. These rates were so fixed as to bring in to the field surveyors who were kept idle for some time for want of plots, a fair return for the time they thus lost. The total areas surveyed and amounts earned are shown for each camp separately in the Statement (B). There were in all 123 field surveyors employed off and on in the party, but if the broken and complete periods are taken all together, it would be equivalent to 85 surveyors working throughout the six and-a-half months. The average monthly earnings of a surveyor this year was Rs. 47, which is a higher rate than that of last year, and considerably over what is usually paid by the Survey of India parties working in Burma. The Hindustani surveyors did not do at all well; the Burman surveyors working under the five years' scheme earned very fair sums, but these were out-beaten by the other indigenous surveyors of the party. The average size of the field this year has been 0·33 of an acre, being largest in Bassein and smallest in Prome. By the term "field" is understood all cultivated or uncultivated paddy-fields and all gardens, miscellaneous plots of lands, tanks, land round tanks, and the like, of which the area does not exceed 10 acres. Items, the areas of which are above this, have been classed under the head of "Topographical and other features," which include hills, waste lands, roads, rivers, creeks, jungle, and the like. The work of surveying topographical features was like last year entrusted to the field surveyors, who were trained for the purpose by

the Myoôks and Inspectors, and who, on the whole, performed these duties in an efficient manner.

Difficulties of survey and organization of party.

18. The difficulties of survey were pretty much the same as last year, namely, the intricate nature of the country worked, in cultivation being for the most part in patches scattered throughout its length and breadth, the smallness of the average field, the fact of the three camps being so far away from each other, and the loss of time entailed in shifting them from place to place so frequently, the getting of plots from the traverse camps piecemeal, bits here and bits there, the heavy jungle cutting which had to be done in all five districts, and lastly the having to survey on the triangulation system instead of on ready-made plots. The organizing of the party also took up a good deal of time and caused no inconsiderable amount of anxiety. The Camp Officers were Burmans, and the entire correspondence had to be done through the medium of the vernacular. All this tended to enhance the difficulties of work. In the matter of accounts particularly a great deal of work was thrown upon the headquarters office.

Outturn of work and proportion of cultivation to waste.

19. The total area completed comprises 1,440·53 square miles, divided for each of the three camps as follows :—

For Camp No. 1	...	in Hanthawaddy=340·85 in Tharrawaddy =126·25 in Henzada =61·82	=528·92 square miles.
For Camp No. 2	...	in Prome	=483·50
For Camp No. 3	...	in Bassein =73·12 in Henzada =354·99	=428·11 square miles.

The area done by Camp No. 1 is the largest, owing to its having nothing but flat country to survey, whereas each of the other two camps had a certain extent of undulating or hilly land to work over, while Camp No. 3 did least in consequence of its having lost a good deal of time in marching its camp across country from the Myaungmya side of the Bassein district to the Myanaung side of the Henzada district.

The proportion of cultivation to waste for the entire tract surveyed is as 1 to 5·11, and for each district separately as follows, namely:—

In Hanthawaddy as	1 to 5·75
In Henzada as	1 to 5·30
In Tharrawaddy as	1 to 5·78
In Prome as	1 to 5·81
In Bassein as	1 to 1·46

This proportion is about twice of what it was last year, due to the large areas of jungle that had to be surveyed along with the scattered patches of cultivation. This could not be avoided unless it was desired to exclude small bits of jungle all over the country, and thus form eye-sores in the maps without rendering the survey work much easier or inexpensive. In the Thôngwa district, which is said to be so highly cultivated, the proportion of cultivation to waste is given by No. 7 Party at 1 to 3·2, and by the settlement at 1 to 4·3.

This year's recess work.

20. The recess-season this year is to embrace a period of 5½ months only; it commenced on the 16th June 1891. The work to be done during this term will consist of the inking-in of the 16-inch maps, the typing, numbering, and preparation of area statements in duplicate, the completing of the holding registers and making the preliminary entries on the published maps for the first year's supplementary survey, the recopying on the traverse plots the sheets surveyed on the triangulation system, the reduction of the maps to the 2-inch scale, and the preparing of the 16-inch and 2-inch maps for lithography. The number of hands employed in the recess is as follows, namely, 70 Inspectors, clerks, draughtsmen, computers, &c., and 13 menials. In consequence, however, (i) of the survey of a larger area of country having been completed during the field season than was originally calculated upon, due partly to the prolongation of the open season's term, (ii) of the triangulation system having been adopted for kwins of which the plots were not forthcoming in proper time, whereby much additional work would be thrown upon the office during the recess months in the recopying of the original plans on the plotted sheets subsequently furnished, and (iii) of the curtailing of the recess season's term by half-a-month owing to the late setting in of the rains this year, it became necessary to strengthen the recess establishments of each of the three camps by six computers, in order that the mapping and registers, &c., may be completed by the 30th November 1891. To this end an additional expenditure of Rs. 2,970 in all was applied for and obtained, which was to be met from miscellaneous savings in the sanctioned budget allotment for the party of the year.

Myoôks.

21. Maung San Dun held charge of Camp No. 1 which worked in the Hanthawaddy and Tharrawaddy districts chiefly, but also to a small extent in Henzada. He has throughout worked both zealously and well, and is an officer who possesses much tact and judgment. His camp alone completed the survey of such a large area as 529 square miles during the field season, and his recess work is also now well advanced. Maung San Dun suffered from a bad description of sore-eyes for nearly a month, the result of much exposure to the sun on the sandy islands of the

Irrawaddy, but this in no way interfered with the progress of his survey work. He intends applying for three months' well earned privilege leave from the 1st of August next, which I hope will be granted to him.

Maung Pyu Than continued in charge of Camp No. 2, his field of operations being confined to the Prome district, on both sides of the Irrawaddy river, in the Padaung and Mahathaman townships. He had certain difficulties to contend against, in having a large area of hill work to get through, in the loss of time entailed through sending his surveyors backwards and forwards over the country, just as plots were furnished by the traverse camp and in the sickness from fever which most of his surveyors and Inspectors suffered from while engaged in work towards the hills of the Padaung side during the earlier part of the season. Notwithstanding all this he succeeded in accomplishing the survey of 483 square miles of country. Maung Pyu Than has worked hard and exercised a better control over his men than he did in the previous year, although there is yet room for improvement in this respect. In one case an Inspector deliberately fudged several of his partal lines without being discovered by his Myoôk. Maung Pyu Than was also employed for eight days on census work.

Maung Tun was in charge of Camp No. 3, and worked in the districts of Bassein and Henzada. He completed the survey of an area of 428 square miles, and would certainly have done much more but for the loss of time he experienced in marching his camp across country from Myaungmya in the Bassein district to Myanaung in the Henzada district, and also to the fact of the whole of his surveyors continuing absolutely idle for the space of a month in consequence of the delays that occurred in the receipt of plots from the traverse camp. He has worked with praiseworthy zeal, but was disposed to rely too much on the honesty of his Inspectors for good work.

Mr. Hardinge was placed in charge of the map section of the office work and performed his duties in connection therewith with indefatigable energy. Under his supervision all the 16-inch maps of last year were printed and published before the end of the recess season, and the 2-inch reductions thereof were completed in the first week of April. After this, he was sent to the Hanthawaddy traverse camp to assist in the plotting of sheets so urgently required by Maung San Dun. Here he did not continue long, as his services were required for the purpose of checking the holding survey work of the Shwegyin and Toungoo districts. He was employed on this work from the 9th May to the 16th June, and was commended for his labours in relation thereto by the Financial Commissioner. Since then he has been working in the office on his old duties of the final preparation and passing of maps. Mr. Hardinge is a competent surveyor and draughtsman, and promises to be yet further useful as his sphere of action extends.

Maung Tha Byaw was in charge of the Holding Survey in the Sandoway district, and, on completion of the work there, was transferred to this party with effect from the 1st June 1891. He was at first deputed to Toungoo to assist in the checking of the holding survey work of that district. On completing his duties here he returned to headquarters on the 17th June, since which time he has been employed in the map section department of this office, where he has proved himself very useful, as in addition to his qualifications as a surveyor, he is a neat draughtsman. In the event of Maung San Dun taking leave Maung Tha Byaw will be placed temporarily in charge of Camp No. 1.

Inspectors, field surveyors, &c.

22. Of the nine Inspectors who were employed in the party during the year, only three worked really well; the others performed their duties either carelessly or dilatorily. In one case, in the Prome camp, the Inspector behaved in a most outrageous manner, having systematically fudged in many of his partal lines and corresponding field book and partal diary entries. For this the man was peremptorily removed from the service. The Field Surveyors have, on the whole, worked satisfactorily. The few Hindustani Surveyors, remnants of the previous year who had to be taken on in terms of their leave certificates, proved rather a failure for the reasons already given in paragraph 2 of this report. The Burman Surveyors of the five years' scheme worked willingly and well with the exception of seven out of the number, one having fudged his work repeatedly in a most daring manner. The other indigenous surveyors did about the best, although there were several of them who had often to be fined and otherwise punished, work having to be frequently rejected and in more than one instance found to be grossly fudged. In two cases in particular, it was discovered that in four kwins of the Yin-e circle, although the actual cultivation was carefully and accurately surveyed, several pattas, not yet brought under the plough which were situated some distance in the interior were all, without exception, sketched in on the maps. There were several resignations and removals (including four deaths), from sickness and other causes during the year as will be apparent from the fact that 123 field-surveyors were entertained from time to time, while 85 is the average number who worked throughout the field-season's term.

Cost of operations.

23. The total cost of the work exclusive of that for holding marking, preparation of maps and registers for Supplementary Survey Offices, expenditure on account of holding and other surveys and the drawing and preparation of the 16 and 2-inch maps for lithography for the entire survey year,

comprising the period 1st December 1890 to 30th November 1891, amounts to Rs. 97,320-3-11. Of this sum Rs. 78,002-11-11 relates to the actual expenditure incurred during the field season and Rs. 19,317-8-0 to the estimated expenditure of the current recess-season. The area surveyed by the local field-to-field party this year is 1,440·53 square miles which gives the cost per square mile at Rs. 67 or annas 1-8 per acre, against 283·96 square miles surveyed last year at a cost of Rs. 175 per square mile, or annas 4-4 per acre. It will thus be seen that the cost of the work this year is about one-third of what it was the year previous; and might have been lower had the delays in the receipt of traverse plots not occurred and necessity not arisen for work on the triangulation system. Anyway the present rate is incomparably lower than that given by any of the Indian cadastral survey parties which have been hitherto working in Burma. The cheapest worked cadastral party is No. 7, the cost of working which for the purely cadastral section per square mile was in 1877 to 1888 Rs. 143 and in 1888-89 Rs. 135. Considering, too, that the work of the local agency party has been accomplished by a purely Burman agency and that the portions of country situated as they were in five different districts operated on were of a difficult character for survey work, the areas being scattered in patches throughout their length and breadth, and that the tracts are such as are not usually assigned for work to Survey of India cadastral parties, the results of the year cannot but be considered to be highly satisfactory.

Holding marking.

24. The cost of holding marking, &c., comes to Rs. 2,222-11-1. Eight holding markers and nine tracers were employed on this work; 26,748 holdings having been thus delineated, with an area of 153,572 acres. More attention was paid to the testing of the holding marking work this year, and there was a decided improvement in its quality. The testing in the Bassein district appeared to have been neglected, in consequence of which an Inspector was sent specially from Myanaung to complete this work, and thus rectify the omission. In the Aingkalaung circle the holding marking was found to be defective, and the man in fault punished for the work.

Increase in area and revenue due to present survey.

25. The increase in the area under assessment of the local field-to-field survey's work over the thugyis' measurements comes to 47,658 acres with a revenue demand of Rs. 81,950, against a similar increase for last year's work of 16,000 acres, having a revenue demand of Rs. 25,000. Particulars for the year, in this respect, will be found in Statement B. The percentages of increase in area and corresponding revenue over the thugyis' figures for the past two years, for each district are as follows, namely.—

District.	Percentage of increase in area		Percentage of increase in revenue	
	Over Thugyis' figures of		Over Thugyis' figures of	
	1889-90.	1890-91.	1889-90.	1890-91.
Hanthawaddy	47·02	19·28	46·46	19·19
Henzada	36·42	33·95	36·36	33·96
Tharrawaddy	40·54	45·41	44·37	47·21
Prome	26·35	20·40	23·25	18·51
Bassein	201·43	158·27	199·27	157·96
Total ...	44·99	35·15	47·57	36·06

From the above it will be seen that, in all but Tharrawaddy the thugyis' areas of this year are considerably over what were shown by them in the year previous. These arbitrary increases were doubtless made from the fear that the survey areas would make manifest the annual under-measurements, and would not be due to extensions of cultivation. Hearing from the Camp Officers that many of the thugyis were engaged in thus enlarging their areas all round, the necessary precautions were taken for obtaining from the Deputy Commissioners concerned the figures relating to the year previous as well. It is on this account therefore that the results of this year's local survey work have been contrasted with the thugyis' figures of 1889-90 instead of with those of 1890-91. In one case, that of the Bawlè circle of the Hanthawaddy district, the thugyi from fear of the new survey overdid it, in increasing his assessed area of this year over that of the previous year one-half as much again, namely, by 3,298 acres, which was 492 acres over and above the survey area! The Thugyi of Theingôn circle of the Henzada district and many others likewise raised their areas to assimilate them as much as possible with the survey areas.

Holding and other surveys.

26. In accordance with orders received, Mr. Hardinge was deputed to visit the Shwegyin district for the purpose of checking the holding surveys executed there in the open season of 1890-91, about the reliability of which much doubt existed. He was provided with a set of written instructions as to what he was required to do and how he was to set about doing it. The Deputy Commissioner of Shwegyin was at the same time communicated with, informing him of what was being arranged for the checking for the holding survey work about which he had written, and asking him to afford all requisite help. Mr. Hardinge was engaged on this special work from the 9th May to the 3rd June 1891. He tested the work of these holding surveys, as far as time and the weather would permit, thoroughly and at no inconsiderable amount of personal inconvenience to himself. His report went to show that the plane table had not at all been employed by the surveyors, who were satisfied with visiting the ground merely and recording roughly the chain measurements (length by breadth) of the holdings in a note book, from which entries maps were subsequently prepared with the result that most of the holdings were quite out of position in regard to one another. Besides this, no attempt appeared anywhere to have been made to prepare complete kwin maps with the topographical and other features roughly sketched in as was required by the rules. It was true that there were not many very serious errors in the areas of holdings, but these, at any rate, could not be accepted as being of any permanent value. The assessments for the year were based on these areas, and these would perhaps not have been very different to what the thugyis themselves would have furnished had there been no holding surveys at work. The holding survey work in Shwegyin this year has certainly proved a failure, but this is due entirely to the fault of the Inspector in charge, Maung Tha Myaing. This man was found to have neglected his duties in a most culpable manner, and besides submitted false returns of work. His removal from the service has since, it is understood, been ordered by the Financial Commissioner. After completing his checking of holding survey work in the Shwegyin district, Mr. Hardinge was directed to proceed to Toungoo to similarly check work in that district. Maung Tha Byaw, who had just returned from the Sandoway district, of which he had been conducting the holding surveys, was also sent to assist in the above work. Mr. Hardinge was occupied in his duties in the Toungoo district from the 4th to the 16th June 1891, and Maung Tha Byaw from the 9th to the 17th idem. Mr. Hardinge was told specially to inquire into the matter of certain 22 complaints which the Commissioner of Tenasserim reported as having been disposed of. A *précis* of these cases was, with the permission of the Deputy Commissioner of the place, made by Mr. Hardinge, from which it was manifest that the complaints in question arose not from errors of survey, but from a faulty preparation of the registers and other causes. The kwins checked by Mr. Hardinge and Maung Tha Byaw clearly proved that the holding survey work in the Toungoo district, unlike that in Shwegyin this year, was thoroughly and well done. The survey was in charge of a reliable and trustworthy Chief Inspector named Maung Po Aung. To this man therefore is due all the credit for the good work done here. In regard to the holding and other surveys generally, some assistance was off and on rendered by this office. Surveyors and Inspectors were provided and the requisite supply of surveying instruments and articles of stationery sent to the officer concerned, and got back from them also at the conclusion of field-work. The party for the holding survey of the Sandoway district was completely manned from the Lower Burma Field-to-field Survey Office.

Lithography and publication of maps.

27. It was at first proposed to have all the maps relating to the work of the local Field-to-field Survey published by the Survey of the India Department in Calcutta, but when it was found that what seemed to be so a high a figure, if I recollect rightly, as Rs. 28 per 16-inch sheet and Rs. 40 or so for each 2-inch sheet was asked for the work, and that besides which it was said that the maps could only be given in one to two years' time, provided also there was no other demand for similar work from elsewhere on that department, it seemed all the more necessary to have the publication of the maps done locally, both with a view to economy and rapidity of publication. Steps were accordingly taken to have the lithographing done in the Grvernment Press at Rangoon, the preparation of the sheets on the lithographic paper being executed by the Field-to-field Survey Office. The requisite plant and material were therefore obtained and the printing of the maps relating to last year's work done here. There were thus 343 16-inch sheets and four 2-inch sheets printed; 25 copies of each of the former were published and 200 copies of each of the latter. The cost of these is as follows, namely, Rs. 10 per sheet for the 16-inch maps and Rs. 15 per sheet for the 2-inch maps. In regard to this cost the Superintendent of Government Printing writes as follows: "These figures really exceed the cost of the work, but I have added some-"thing thereto on account of cost of plant." The paper used for these maps is the thin, white, hand-made, size 30″ × 22″ which stands the wear and tear of the Supplementary Survey Offices best. During the present recess-season arrangements have been made for the publication of about 1,908 16-inch sheets and about twenty 2-inch sheets in addition to 15 more belonging to last year's work, which were not then lithographed owing to the details of this year's work remaining over for introduction into them. The cost of the map

section of the office for this year, actual and estimated, amounts to Rs. 8,811-15-6, which will give the cost per 16-inch sheet at Rs. 4-8-0 and of each 2-inch sheet at Rs. 6-12-0. To this must be added the present estimate of the Superintendent of Government Printing, namely, Rs. 9 and Rs. 14 respectively, which will bring the total cost of these maps up to Rs. 13-8-0 per 16-inch sheet and Rs. 20-12-0 per 2-inch sheet, which is about one-half of what was demanded by the Survey of India Department for the work. Of the 25 copies of the 16-inch sheets published, 22 are immediately on publication sent to the Deputy Commissioner concerned, three being retained in this office, one for use by Camp Officers and two to be bound in book form; while of the 200 copies of the 2-inch maps it is proposed to send hereafter 100 copies to each of the Deputy Commissioners to whose districts they refer, retain three copies in this office, and make over the remaining 97 copies to the Government Book Depôt, to be disposed as may be ordered.

Employment of Burman field surveyors under the five years' scheme.

28. As mentioned in paragraph 3 of this report, 17 Burman field surveyors who were working under the five years' scheme were taken over temporarily from No. 7 Party for work in the local Field-to-field Survey Party on the condition that the period for which they were employed in this office counted towards the five years' scheme. Two (Maung Po Win and Maung Kaing Gale) out of the total number, I regret to record, died from attacks of a malarious fever contracted during the field season; three who had completed their five years' apprenticeship and had thus become entitled to certificates under the scheme were, on the recommendation of the officer in charge No. 7 Party, given work during the recess in the office, while the rest were granted leave certificates with instructions to rejoin No. 7 Party on the 15th November 1891, the date fixed for their return by Mr. Littlewood, the officer under whose charge these apprentices were specially placed. The total amount earned by those surveyors at the contract rates of payment amounted to Rs. 3,926-10-0, which was duly paid to them. The bonuses due to them in terms of Rule (*d*) of the five years' scheme rules, which formed an accompaniment to Revenue Secretary's No. 487-18S., dated the 30th April 1886, and of the Director of the Department of Land Records and Agriculture's No. 452-85S., dated the 21st October 1890, came to Rs. 439-8-11, which sum was handed over to the officer in charge No. 7 Party to be deposited by him in the Government Savings Bank to the credit of the surveyors concerned in accordance with the provisions of the rules previously referred to. These Burman surveyors earned, on an average, Rs. 41-12-4 per mensem, and with the 10 and 5 per cent. bonuses so much as Rs. 46-7-2, and thus, as compared with the earnings of the other apprentices under the scheme quoted by No. 7 Party, did remarkably well. Two of the surveyors failed to earn Rs. 25 a month, and so were not entitled, under the rules, to leave pay.

Fines realized.

29. The total amount of the fines inflicted on inspectors, field-surveyors and other of the Lower Burma Field-to-field Survey Party during the year amounted to Rs. 1,061-11-2, which sum has been credited to Government.

Value of surveying instruments, &c., recovered.

30. The recoveries made during the year, of which the amounts were credited to Government by Treasury chellans, on account of the loss or destruction of mathematical instruments and articles of stationery, were as follows:—

	Rs.	A.	P.
By the Lower Burma Field-to-field Survey ...	379	6	5
By holding surveys	90	5	2
By the Upper Burma surveys	5	0	0
Total ...	474	11	7

Besides this, a sum of Rs. 119-6-10 was written off on the above account by orders of the Financial Commissioner.

Fire at Myanaung.

31. On the 26th February 1891 a general conflagration occurred in the very heart of the town of Myanaung. Camp No. 3 was located here at the time, and the building which was occupied by the office was burnt to the ground and Government property to the value of Rs. 153-12-10 completely destroyed. The maps and other valuable records were fortunately rescued.

Present office.

32. The building in Godwin road at present occupied by the headquarters office is conveniently situated and in every way well suited to our requirements. It has been recently extended and all necessary improvements made to suit the special wants of a large survey office by the Public Works Department. The municipal taxes for the premises amount to Rs. 390 per annum.

Partalling.

33. The amount of partalling of the field-surveyors' work during the year, done by the Inspecting officers of the party, is as follows. Out of a total number of 1,027 kwins surveyed, 958 were partalled by the Inspectors, 224 (23 of which were not tested by Inspectors) by the Myoôks, 41 by the Superintendent, and two by the Director. Time would not permit of only 46 kwins being partalled at all. The explanation to this is simple: the 16-inch plots relating

to these kwins were received by the Camp Officers concerned at the close of the field-season only, and as most of these were surveyed on the triangulation system and the kwins contained almost all jungle, the Inspectors devoted their available time to testing the kwins in which the work seemed to require their presence more urgently. The time of the Inspectors was besides much taken up in moving from place to place over a large extent of country, in checking work generally, and in materially helping their surveyors to survey in accordance with the triangulation system. The Myoôk in charge of Camp No. 1, also, was owing to a bad attack of sore-eyes, prevented for over a fortnight from doing any partalling work. In addition to this there was the fact of the rains, which impeded work off and on towards the close of the field-season, having set in and partailing hindered to some extent. The partalling of the kwins in question was, however, not very important, containing as they did little or no cultivation. Most of them were visited by either the Myoôks or Inspectors, but no regular partal lines were run. The detail survey was tested by 1,151 linear miles of check surveys, of which 954 miles were measured by Inspectors, 184 by Myoôks, and 13 by the Superintendent.

Permanent and temporary marking of theodolite stations.

34. All theodolite traverse stations were permanently marked by No. 12 Party last year with pottery cylinders sunk nearly flush with the ground. This year, however, in consequence of its being represented that the traverse lines which would have to be run over hilly country, such as would be met in Prome and Henzada, would be very short, and that the cost of marking every station permanently therefore would naturally be very high, it was decided to relax the former practice by allowing for hilly and otherwise difficult country, where the traverse lines would have to be necessarily very short, as follows,—

(i) all trijunction stations to be permanently marked;
(ii) all "jawabs," that is, the first station on each side of a trijunction station, to be similarly marked by pipes; and
(iii) for the intervening stations all pipes to be put in at the stations on an average of about 5 to 7 chains apart.

This relaxation was permitted on the distinct understanding that the pipes would be buried in the presence of the native surveyors themselves, and to this end the officer in charge of No. 12 Party engaged to issue strict orders about seeing that the pipes were buried at the correct points only. In accordance with this plan, out of a total number of 26,551 theodolite stations fixed by No. 12 Party this year, 422 alone were not permanently marked by means of clay pipes. Of this number, one was situated in Tharrawaddy, 371 in Henzada, and 50 in Prome.

Special allowance to Myoôks.

35. A personal allowance of Rs. 50 per mensem was granted to each of the four Myoôks of the party with effect from the 1st December 1890. This was done with the object of placing these officers on the same footing as Superintendents of Land Records, who, as Myoôks, receive such an allowance on their work being reported to be satisfactory. It was urged in their behalf that the duties performed by the Myoôks in charge of Lower Burma Field-to-field Survey camps were equally onerous with and as difficult to perform as those ordinarily required of the other class of officers previously named, and that for this reason the same concessions be extended, under the like restrictions to good work done, to the one class as was enjoyed by the other. This extra allowance has been well earned by the Myoôks of the party and has formed an additional encouragement for them to work both zealously and well.

Accounts and periodical reports.

36. The system now adopted of drawing moneys for the working expenses of the party on abstract bills as needed, and submitting detailed bills in the usual forms to the Comptroller at the end of each month, has worked admirably. During the field-season moneys were remitted to the Camp Officers on such treasuries or sub-treasuries as they required them, by means of abstract bills drawn in their favour. In this way these officers were kept in funds, and in no way inconvenienced for want of money except on three occasions, when some little delay arose from the Henzada and Prome treasuries refusing payment for want of the necessary instructions from their head office. The preparation of the monthly accounts, which are somewhat complicated, by the headquarters' office always occupied much time and gave a deal of trouble owing to the Camp Officer's accounts being generally very mixed. Latterly, though more correct accounts began to be submitted by them, the periodical reports, returns, &c., were submitted by the various officers, in the prescribed forms, more or less punctually. Most delay was generally experienced in the submission of returns from Camp No. 2. Throughout the field-season the District Officers of all five districts worked in this year were furnished monthly with copies of the progress reports relating to the field-work done in their respective districts; this was in accordance with orders.

Assistance rendered by local officials.

37. The assistance rendered to the local agency party by the local officials within whose jurisdictions the party worked this year, was complete except in two instances in the Henzada district and one in Prome. In the former, the thugyi of Payè circle

failed to render any help to the local survey camp, for which it is believed the thugyi was fined ; the second case being that of the ywathugyi of Yindaw village, who persisted in not only not rendering assistance to four of the field surveyors who were sent for survey to his village, but in actually obstructing survey operations by forbidding his villagers to point out the survey marks to the surveyors, and in charging them double the price of the ordinary necessaries of life. The surveyors in question lost three days of work in being thus frustrated and in endeavouring to search for pipes unaided by the villagers. The matter was duly reported to the Deputy Commissioner, who severely punished the ywathugyi in fault. In the case of Prome, the Myoôk of Padaung did not render much help to Camp No. 2, for which he was reprimanded by the Deputy Commissioner of the place.

Inadequacy of prevailing rates on land for some circles.

38. In some of the circles surveyed this year it would seem that the prevalent rates of assessment are of an uneven character ; in some places they would appear to be somewhat low, and in just a few places higher than what the land can seemingly well bear. One very marked and I must say exceptional instance in this respect occurs in Tharawaw circle of the Tharrawaddy district, where while in Ywagale south and Aingtalôk south kwins there is a uniform rate of 8 annas per acre on paddy land, in the adjoining kwins, with the land similar in all respects, the rate is Rs. 1-4-0. If required, Statement No. 29 of the additional appendices may be consulted to see in what circles and to what extent for each kwin, in the opinion of the Camp Officers, changes in the existing rates seem desirable. Considering, however, that there is such a large increase, namely, of 45 per cent. in the assessed areas, due to the present survey, it would scarcely be worth the labour and expense to institute elaborate inquiries with a view to the modification, in perhaps a very few instances only, of the current rates. These investigations, in my thinking, can be very well postponed up to the time when the next settlement comes round, which would for the districts in question be not very distant. Meantime, future assessments can be based on the areas as ascertained by the Field-to-field Survey, corrected always up to date, just as has been done in regard to the areas surveyed by local agency last year.

Notices to Kyedangyis.

39. The cost for the preparation of the notices, which were issued to headmen of villages under the Burma Boundary Rules for the protection and preservation of permanent survey station marks incurred by No. 12 Party last year, amounted to Rs. 514-8-0. This year similar charges will, it is believed, amount to Rs. 277-11-4 only. Altogether 1,125 copies of notices, on the 4-inch scale, were served on the kyedangyis this year by No. 12 Party, 268 such copies yet remaining over for service.

Advance arrangements for traverse survey work next season.

40. Application has already been made for the services of two surveyors of the Survey of India Department from the 1st October 1891 to assist in the traverse work to be conducted by local agency during the next two years ; but hope appears to have been held out for the transfer of only one such officer. In any case, it is proposed to form only two traverse camps next year, one to work in the Bassein and Thôngwa districts and the other in the Thayetmyo district. One camp it is hoped to place under the charge of the Survey of India officer, when he comes over, with Myoôk Maung San Dun to assist him, while the other camp could be placed under Mr. Hardinge, who has now familiarized himself with the work, with Myoôk Maung Tha Byaw to assist. The two field-to-field camps which it is intended only to keep up can continue to be under Myoôks Maung Pyu Than and Maung Tun. One officer at least will be required for the map section of the office in the place of Mr. Hardinge. This place could be given to a very deserving and qualified man, Maung Shwe O, who is at present Head Inspector in Camp No. 1. This man was specially selected from the Land Records Office in Bassein owing to his superior attainments as a surveyor and draughtsman, his intelligence and respectability and his capacity to extract work out of his subordinates. All the requisite advance arrangements have been or soon will be started, in reference to next year's traverse and detail work, the necessary material in the shape of maps, records, and data having already been asked for from Nos. 7 and 12 Parties, the Map Department of the Survey of India Office, and from Superintendents of Land Records. Arrangements for the usual demarcation, obtaining of supplies of surveying instruments and stationery, preparation of estimates, and engaging of hands, &c., will shortly also be taken in hand so that the traverse and detail sections may be ready to start field-work on the 1st November and 1st December next respectively.

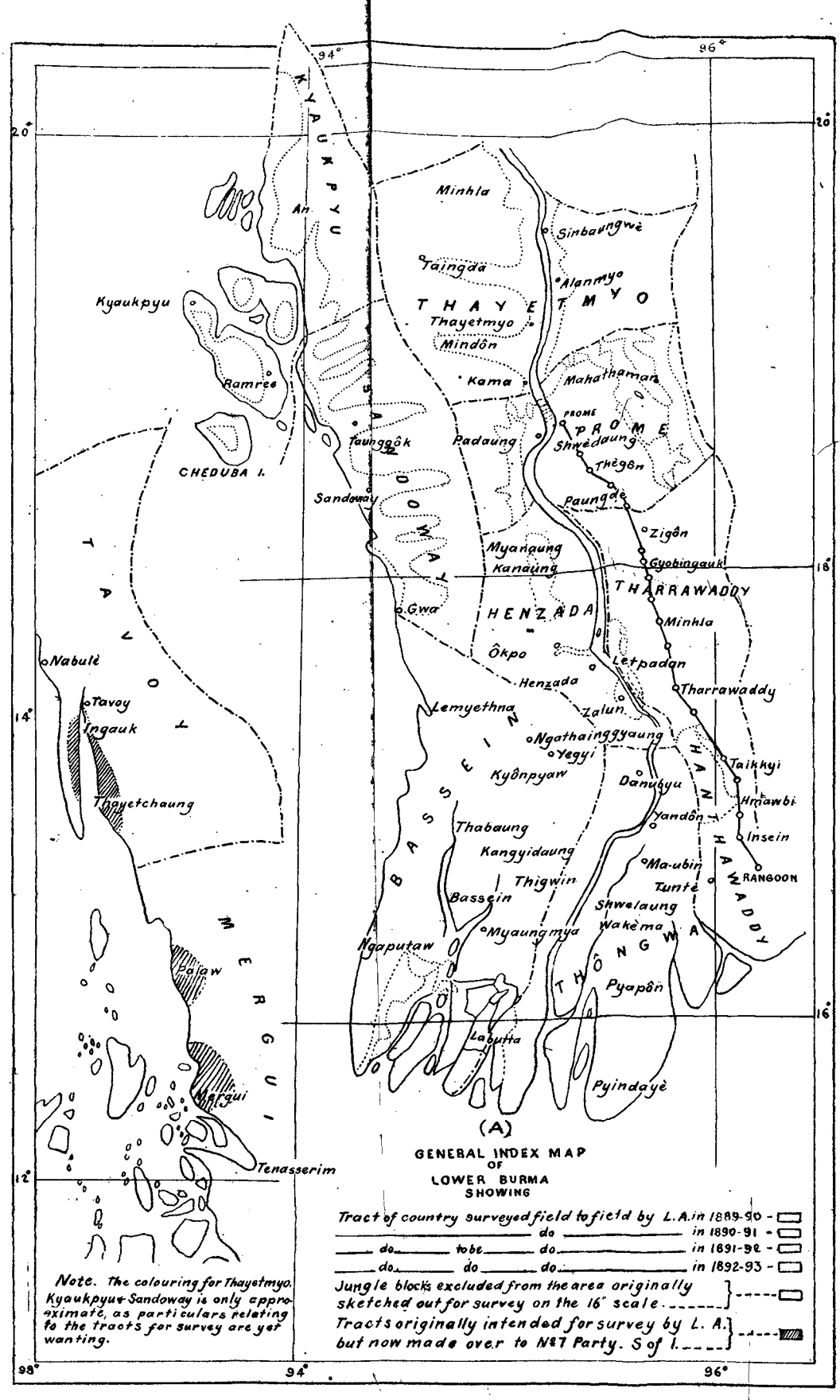
Appendices.

41. In order not to render this report too cumbersome, only two appendices,—a General Index map (A) and an Abstract of various statements (B) have been attached to it. But there are other maps and statements which may be found useful for reference ; these are accordingly submitted in addition and number from 1 to 31.

J. C. CLANCEY,

On special duty under the Director of Land Records and Agriculture, Burma.

RANGOON : }
The 17th July 1891. }



(A)

GENERAL INDEX MAP
OF
LOWER BURMA
SHOWING

Tract of country surveyed field to field by L.A. in 1889-90 -
do in 1890-91 -
do to be do in 1891-92 -
do do do in 1892-93 -
Jungle blocks excluded from the area originally sketched out for survey on the 16" scale.
Tracts originally intended for survey by L. A. but now made over to No 7 Party. S of I.

Note. The colouring for Thayetmyo, Kyaukpyu & Sandoway is only approximate, as particulars relating to the tracts for survey are yet wanting.

B.—*General Abstract of the various statements which accompany the Lower Burma Field-to-field Survey by Local Agency Report for 1890-91.*

Number of camp.	District.	Number of kwin plots remaining over from field-season of 1889-90.	Number of kwin plots received during the recess season of 1889-90 from Traverse Party.	Number of kwin plots received during field season from Traverse Party.	Number of kwins completely surveyed by field-to-field survey.	Average number of days 86 surveyors were idle owing to non-receipt of plots from Traverse Party.	Number of fields surveyed.	Average size of fields surveyed.	Area of field surveyed.	Area of topographical features surveyed.	Total area of all descriptions surveyed.	Amounts as fixed paid to field surveyors according to contract rates of payment.	Cost of operations to Government from 1st December 1891 to 15th June 1891, including holding markers' and tracers' pay and travelling allowances.	Number of Inspectors employed for field work.	Number of field surveyors employed.	Number of holding markers employed.
												Rs. A. P.	Rs. A. P.			
1	Hanthawaddy...	17	211	79*	309	30·3	94,941	0·34	32, 299·00	185,844·00	218,143·00	8,886 9 8	27,465 12 4	3	29	3
1	Tharrawaddy ...	...	...	110	116		35,225	0·33	11,916·00	68,883·00	80,799·00					
1	Henzada ...	...	...	27	27		1,737	2·42†	4,213·00	35,354·00	39,567·00					
2	Prome ...	23	97	237	345	*Nil.*	166,175	0·27	45,286·54	264,152·00	309,438·54	8,327 7 8	28,499 3 6	3	29	3
3	Bassein ...	32	54	...	86	23·7	35,826	0·52	18,960·86	27,837·81	46,798·67	8,494 2 6	28,736 11 2	3	27	2
3	Henzada ...	...	...	134	143		118,600	0·32†	38,094·37	189,100·36	227,194·73					
	Headquarters office.	...	...	...	...	...	...	...	...	...	...	.....	12,618 8 11	...	...	...
	Map section* ...	...	...	...	...	...	...	...	...	...	...	.....	8,811 15 6	...	...	...
	Holding marking	...	...	...	...	...	...	...	...	...	...	.....	2,222 11 1	...	...	...
	Preparation of S. S. maps, settlement registers, and area statements, &c.	...	...	...	...	...	...	...	...	...	...	.....	4,500 0 0	...	...	...
Total ...	5	72	362	587	1,026	28·0	452,504	0·33	150,769·77	771,171·17	921,940·94	25,708 3 10	112,854 14 6	9	85	8

* Including cost incurred in connection with holding and other surveys.

† Average = 0·35.

B.—*General Abstract of the various statements which accompany the Local Burma Field-to-field Survey by Local Agency Report for 1890-91*—(concluded).

Number of camp.	District.	Number of kwins of which holdings were marked.	Area of holdings marking.	Cost of holding marking.	Areas, according to survey, of revenue-paying lands, including pattas.	Thugyis' areas for corresponding revenue-paying lands, including pattas.		Increase of survey areas over Thugyis' areas.		Revenue calculated at current rates on the areas found by survey.	Revenue calculated at current rates on the Thugyis' areas.		Increase in revenue due to field-to-field survey.		Remarks.
						For 1889-90	For 1890-91.	As compared with thugyis' figures for 1889-90.	As compared with thugyis' figures for 1890-91.		For 1889-90.	For 1890-91.	As compared with thugyis' figures for 1889-90.	As compared with thugyis' figures for 1890-91.	
			Acres.	Rs. A. P.	Acres	Acres	Acres	Acres	Acres	Rs.	Rs.	Rs.	Rs.	Rs.	
1	Hanthawaddy...	825	52,376·00	699 15 6	30,993	21,080	25,983	9,913	5,010	60,457	41,278	50,722	19,179	9,735	
	Tharrawaddy ...				15,277	10,870	10,506	4,407	4,771	24,966	17,293	16,959	7,673	8,007	
	Henzada ...				6,106	3,561	3,705	2,545	2,401	8,413	4,896	5,157	3,517	3,256	
2	Prome ...	304	44,759·82	800 2 9	44,760	35,633	37,174	9,127	7,586	48,744	39,539	41,128	9,205	7,616	
3	Bassein ...	222	56,435·93	722 8 10	18,720	6,207	7,248	12,513	11,472	31,593	10,560	12,247	21,032	19,346	
	Henzada ...				37,716	28,563	29,008	9,153	8,708	57,183	43,211	43,822	13,973	13,361	
	Headquarters office.	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Map section ...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Holding marking	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Preparation of S. S. maps, settlement registers, and area statements, &c.	...	...	...	...	...	...	...	...	...	...	...	...	...	
Total ...	5	851	153,571·75	2,222 11 1	158,572	105,914	113,624	47,658	39,948	231,356	156,777	170,035	74,579	61,321	

REPORT ON THE SPECIAL LOCAL SURVEY OPERATIONS OF UPPER BURMA FOR THE SURVEY YEAR 1890-91, BY MR. R. A. GIBSON, EXTRA ASSISTANT COMMISSIONER.

Survey parties employed.

DURING the past field season local surveys of five descriptions were undertaken by different detachments as follows :—

Description of survey.	Strength of detachment.					Where employed.	Scale adopted.	Remarks.
	Myook in charge of camp.	Inspector.	Surveyors and Clerks.	Messengers and Chainmen.	Total.			
I.—Holding survey	...	1	4	16	21	Shwebo district ...	16″=1 M.	
	...	1	4	16	21	Ye-u district ...	do.	
	...	1	4	16	21	Sagaing district ...	do.	
	...	1	4	16	21	Pakôkku district...	do.	
	...	1	4	16	21	Minbu district ...	do.	
II.—Topographical	...	3	20	116	139	Magwe and Mingyan districts.	do.	Oil-fields.
	...					Minbu district ...	do.	
	...					Pakôkku district...	do.	
	...	1	4	16	21	Shwebo district ...	4″=1 M.	Coal-field.
III.—Cadastral	1	3	19	86	109	Shwebo district ...	16″=1 M.	
	1	3	20	91	115	Yamèthin district	do.	
	...	...	3	12	...	Lower Chindwin district.	32″=1 M.	Mônywa town survey paid for by the Municipality; work in hand.
IV.—Supplementary survey and assessment.	...	1	7	26	34	Mandalay district.	16″=1 M.	Taungbyan township.
	...	2	47	34	83		1″=4 ft.	Mandalay town; paid for by the Municipality.

Holding surveys.

2. The holding surveys, commenced in November 1889, were continued in the same districts as before, with the exception of Meiktila, where cadastral survey was introduced by the Imperial Survey Department. During the months of April and May the holding surveys were stopped, and in accordance with orders contained in letter No. 307-10S., dated the 24th January 1891, from the Director of the Department of Land Records and Agriculture, Burma, to the Commissioner, Northern Division, Mandalay, the different detachments were amalgamated into two parties for employment on the cadastral surveys of the irrigated lands in the districts of Shwebo and Yamèthin.

Topographical surveys.

3. The topographical work was of the oil-fields in the Southern Division, and of the Kabwet coal-field with surrounding lands situate in the Shwebo district of the Northern Division. The latter survey was executed by the Shwebo holding survey detachment under authority of letter No. 594-374R., dated the 24th November 1890, from the Secretary to the Financial Commissioner, Burma, to the Commissioner, Northern Division, Mandalay. The oil-field work dealt with in this report is of the completed surveys of Yenangyaung and Minbu oil-fields and of the Yenangyat State reserve. Under recent orders the survey of the Yenangyat oil-field, comprising about 20 square miles of rugged land, was started in May 1891 and a report on the same will be submitted on completion of the survey.

Cadastral surveys.

4. The survey on the field-to-field system, based on theodolite traverses, of the irrigated lands in the Shwebo and Yamèthin districts was put in hand in April 1891, on the abolishment of the holding surveys. At the request of the Commissioner, Central Division, a small party was organized and deputed for the 32-inch scale survey of Mônywa town, the cost of which is being defrayed by that Municipality.

Supplementary survey and assessment.

5. The two Supplementary Survey establishments were employed as before in the Mandalay district, one party in Kutywa-Taungbyan township, and the other in Mandalay town. The cost of the latter is paid for by the Municipality, which derived the

following amounts from assessments on houses and lands made by this survey since it was started :—

	Rs.
1887-88	69,583
1888-89	1,57,222
1889-90	2,53,525
1890-91	1,85,143

The annual reports on the Kutywa-Taungbyan and Mandalay town supplementary surveys, having already been submitted to the Director of the Department of Land Records and Agriculture, Burma, and to the President of the Mandalay Municipality, they need not be mentioned any further here.

Supervision of work.

6. Mr. R. A. Gibson, Extra Assistant Commissioner, continued in charge of the operations, and from October 1890 to June 1891 Maung Ba On, Probationer, Land Records Department, assisted him in the supervision of the holding and cadastral surveys. From July 1891 Maung Po U, Myoôk, 5th grade, has been attached to the office for supervision of mapping and future cadastral survey work. Owing to the Meiktila holding survey being stopped and that detachment placed under the orders of the Subdivisional Officer, Wundwin, the re-organization of survey parties in April, the recruiting of men for the Yenangyat oil-field work in May 1891, and the extra time Mr. Gibson had to devote to oil-field surveys, the programme of survey inspection, as approved of by the Director of the Department of Land Records and Agriculture, Burma, in his letter No. 611-22M., dated the 22nd September 1890, could not be adhered to. The different parties were visited and the work tested by Messrs. Gibson and Ba On in the following order :—

Name of survey.	Number of maps examined.	When inspected.	Number of times visited.	Test lines in chains.	Remarks.
Shwebo	41	23rd to 29th October 1890 ... 12th to 19th December 1890 ... 13th to 21st January 1891 ... 15th March to 30th June 1891 ...	4	1,608	
Ye-u	15	13th to 16th December 1890 ... 28th February to 4th March 1891.	2	614	
Sagaing	10	14th to 19th November 1890 ... 20th to 23rd December 1890 ...	2	506	
Pakôkku	11	27th November 1890 to 2nd December 1890.	1	540	
Minbu	14	23rd to 28th November 1890 ... 6th to 14th February 1891 ...	2	722	
Oil-field	75	13th July 1890 to 19th August 1890. 9th to 28th October 1890 ... 25th January to 21st February 1891. 20th May to 26th June 1891 ...	4	*	* Examined *in situ*.
Yamèthin	28	6th to 15th May 1891 ... 1st to 9th June 1891 ...	2	906	
Meiktila	6	9th to 17th October 1890 ... 13th to 15th November 1890 ...	2	488	Previous season's work tested.

Maung Byaung, Survey Inspector, Mandalay Supplementary Survey, assisted also in the supervision of the field-to-field survey of Shwebo and Yamèthin.

When field work started and closed.

7. The dates on which the different detachments reached their ground and when they closed field work are given below.

Description of survey.	Name of party.	Field work.	
		Started.	Closed.
I.—Holding survey	Shwebo	3rd November 1890 ...	15th December 1890.
	Ye-u	1st December 1890 ...	31st March 1891.
	Sagaing	11th November 1890 ...	Ditto.
	Pakôkku	1st November 1890 ...	Ditto.
	Minbu	1st December 1890 ...	15th May 1891.
II.—Topographical	Yenangyaung oil-field ...	1st March 1890 ...	15th March 1891.
	Minbu oil-field ...	15th September 1890 ...	28th February 1891.
	Yenangyat State oil reserve.	1st November 1890 ...	15th December 1890.
	Kabwet coal-field ...	20th December 1890 ...	31st May 1891.
III.—Cadastral ...	Shwebo irrigated lands...	5th April 1891 ...	7th July 1891.
	Yamèthin lands ...	15th April 1891 ...	30th June 1891.
	Mônywa Municipality	7th April 1891 ...	30th April 1891.
		1st August 1891 ...	Detail work in hand.

Theodolite traverse survey.

8. The cadastral surveys of Shwebo and Yamèthin and the topographical surveys of the oil-fields were based on theodolite stations fixed by triangulation and by the traverse system. Men had to be trained for the work before anything could be attempted in this line. The triangulation of the oil-fields gave no trouble, as the bare hills over which the work extended afforded conspicuous points for stations. Great many delays and difficulties were, however, met with in Shwebo and Yamèthin. At the start in April there were only two men conversant with the theodolite work, others with such knowledge having joined No. 3 Imperial Cadastral Party under Mr. Scott in November 1890. Skeleton plans with fixed points required immediately for the detail surveyors could not therefore be prepared until a few more men were trained and the theodolite work pushed on as rapidly as possible by Mr. Gibson in Yamèthin and by Maung Ba On in Shwebo. Clay cylinders were used for station marks in both these districts. Such marks were constantly destroyed by the inhabitants and, to preserve them, the thugyis have been served with notice to bring up delinquents before the nearest Magistrate for punishment. Thorny scrub-jungle on land lying fallow for very many years caused great delay in both districts.

The area triangulated and traversed is—

	112·80	Square miles for oil-field topographical surveys and
	67·00	for cadastral surveys.
Total ...	179·80	square miles.

The area traversed in advance of detail survey is 11 square miles in Shwebo, and 25 in Yamèthin, thus giving sufficient ground for the detail surveyors to have a fair start next field season. The area traversed at Mônywa is 1·5 square mile.

Detail Survey.

9. The detail survey completed is as follows :—

Survey.	Area in acres.			Area in square miles.
	Cultivated.	Uncultivated or waste.	Total.	
I.—Holding Surveys.				
Shwebo	7,764	111	7,875	12·30
Ye-u	3,495	949	4,444	6·94
Sagaing	6,650	1,504	8,154	12·74
Pakôkku	12,883	4,221	17,104	26·72
Minbu	7,631	2,301	9,932	15·52
Total ...	38,423	9,086	47,509	74·22
II.—Topographical Surveys.				
Yenangyaung oil-field	27,909	29,787	57,696	90·15*
Minbu oil-field	2,213	10,685	12,898	20·15
Yenangyat oil-field	...	1,500	1,500	2·34†
Kabwet coal-field (Shwebo)...	...	101,120	101,120	158·00
Total ...	30,122	143,092	173,214	270·64
III.—Cadastral Surveys.				
Shwebo	8,590	912	9,502	14·85
Yamèthin	8,129	1,923	10,052	15·71
Total ...	16,719	2,835	19,554	30·56
Grand Total ...	85,264	155,013	240,277	375·42

* Inclusive of 20,000 acres completed up to 30th June 1891.

† A further area of 4,000 acres surveyed up to 15th July 1891 will appear in next season's report.

Taken separately according to kind of survey, the areas surveyed are :—

		Acres.
(a)	I.—Holding Surveys	47,509
(b)	III.—Cadastral Surveys	19,554
	Total ...	67,063
(c)	II.—Topographical Surveys	173,214

In February last it was anticipated that the areas surveyed during the field season would be :—

	Acres.
For (a)	30,200
For (b)	28,800
Total ...	59,000
For (c)	170,720

The results show an increase on (a) and a decrease on (b) which may be attributed to the following reason. The holding survey detachments were obliged to complete all kwins they had in hand before they took up the cadastral work, so as to avoid leaving kwin maps in an incomplete state. Though the total surveyed area shows about 11,000 acres in excess of that calculated upon, more of field-to-field work could have been accomplished, had its ground been traversed beforehand, and the strength of the parties brought up to the number sanctioned. The work of the Shwebo party was much impeded in May and June 1891 by most extraordinary swarms of black caterpillars which covered fields and fields of the area under survey. The Traverse and Detail Surveyors reached their ground together, and great responsibility entailed on Mr. Gibson to keep all the men fully employed. Inspectors were told off to lay down careful plane table traverses for detail men to start work immediately on arrival, while the Theodolite Surveyor followed fixing all points utilized by the detail men. It was some time before the work of the traverse camp gained on that of the detail.

The circles within which holding and cadastral surveys were made are :—

In Shwebo district—

Kabwet	Of Malè township.
Ngatiagyè	
Sainggaung	
Kôngyi	Of Chaukywa township.
Ywazin	
Kalalu	
Maungkyauktaw	
Bidaukkaung	Of Shwebo township.
Yameiktha	
Migyaungbin	
Khadaungngè	
Sitha	
Kyettat	
Myingatha	
Yathan	
Pauktôn	
Chiba	
Sindôn	
Shadaw	
Nyaunggan	
Zidaw	
Kadaunggyi	

In Ye-u district—

Bôkywa	Of Ye-u township.
Nabè-aing	
Impato	
Kyaungbyu	

Ywathitgyi	Of Shwegyin township.
Myegu	

In Sagaing district—

Myaung	Of Myinmu township.
Nabet	Of Chaungu township.
Shwegôntha	
Thadunmintha	
Pozadaw	
Nagabauk	
Memanyaw	
Gaunggwe	
Ywapulu	
Ngoyano	
Bugaing	
Pareinma	
Magyigwa	
Ngalôndin	
Chaungu	
Kaingsèywa	
Amyin	

In Pakôkku district—

Kywedaung	Of Pakôkku township.
Ngamya	
Kyunbyat	
Bônbat	
Ngatayaw	
Naungu	
Myedaw	
Sindè	
Nwèni	
Mibyaya	
Pôndawbyit	
Sincheya	
Letpangyun	Of Pakhangyi township.
Taungbo	
Myitchè	
Nyaunglha	
Myoza	
Linban	
Tangyi	
Lanywa	
Yenangyat	

In Minbu district—

Kanleywa	Of Salin township.
Paunglôn	
Nyaunglha	

Of the topographical work the oil-fields were surveyed in full detail on the 16-inch scale hills and undulating ground by contours of 10 feet vertical height intervals, which were obtained approximately by means of the common wooden clinometer. An area of 158 square miles of country surrounding the Kabwet coal-field was surveyed on the 4 inch scale, in skeleton, *i.e.*, the main roads and streams, village-sites, coal outcrops, and the boundary of the tract applied for by the Shwebo Coal Mining Syndicate. Should this large area be granted on lease, the Syndicate intends buying up the rights, if possible, of the present landholders in the tract and then settling their Indian labourers. The cultivated area within the 158 square miles was therefore surveyed on the 16-inch scale, and its area accounted for under the head of "Holding surveys." The object of this survey is to define the exact limits of land applied for, the area for which there are landholders' and occupancy rights and the number of villages that will be affected.

Increase over the area as shown by local officials.

10. The assessable area as given by local officials is given below for all the circles surveyed.

A.

District.	Area under assessment or assessable area.		Increase in area.		Remarks.
	As shown by local officials.	As found by present survey.	Acres.	Percentage.	
	Acres.	Acres.	Acres.		
Shwebo	402	710	308	76·6	Irrigated lands, Holding survey.
Shwebo	1,841	4,558	2,717	147·6	Irrigated lands, Cadastral survey
Ye-u	1,096	3,300	2,204	201·1	Irrigated lands, Holding survey.
Sagaing	3,701	6,650	2,949	79·5	State lands, Holding survey.
Pakôkku	9,304	11,476	2,172	23·3	State lands, Holding survey.
Yamèthin	532	950	418	78·6	Irrigated lands, Cadastral survey.
Total ...	16,876	27,644	10,768	63·8	

The great increase for Ye-u is due to a portion of the land being said not to be irrigated and to the assessable area as given by the Thugyis being very much understated.

Demarcation of holdings.

11. The Holding Surveys were conducted as the boundaries of each holding would be pointed out: they needed therefore no special demarcation. In the cadastral tracts of Shwebo and Yamèthin, as the survey of each kwin was completed, the holdings were marked by the same surveyor whose knowledge and familiarity of the land expedited work. In the oil-field tract the cultivated patches met with were situated far from villages and in many instances their demarcation and survey had often to be executed by a special staff of men long after the topographical surveyor had completed his work. The areas in which holdings were demarcated and registers of occupants prepared are as follows:—

Survey.	Area demarcated.	Number of holdings.	Average size of holdings.	Remarks.
	Acres.		Acres.	
Shwebo	9,300	1,960	4·74	
Ye-u	3,495	1,988	1·76	
Sagaing	6,650	4,300	1·55	
Pakôkku	12,883	4,794	2·69	
Minbu	7,181	1,354	5·34	
Yamèthin	7,540	1,867	4·04	
Yenangyaung oil-field	27,909	3,702	7·54	
Minbu oil-field	2,213	405	5·46	
Total ...	77,171	20,370	3·79	

The number of holdings to one square mile of cultivated area surveyed is 169.

Number of fields surveyed.

12. The number of fields measured in Shwebo and Yamèthin is 23,823, covering an area of 16,719 acres. The average size of fields is 0·80 for Shwebo and 0·62 for Yamèthin, or for both 0·70 of an acre. Of the number given there were 715 pan baris (betel-leaf plantations) in Yamèthin district which were very difficult to survey. The number of fields to one square mile of cultivated area is 912.

Cost of survey.

13. The following table gives full particulars of cost * of survey and demarcation in the different districts.

* The cost given is for the year, that for the remainder months being approximately estimated.

Survey.	Area surveyed. Cultivated area.	Area surveyed. Including waste and other lands.	Cost.	Average cost per acre. For cultivated area.	Average cost per acre. For whole area.	Average cost per Holding.	Average cost per Field.	Budget grant.	Probable savings.
	Acres.	Acres.	Rs.	Rs.	As.	As.	Rs.	Rs.	Rs.
I.—Holding survey—									
Shwebo ...	7,764	7,875	2,108·2	4·34	4·28	6·67	...	3,037*	135
Ye-u	3,495	4,444	2,135·7	9·77	7·69	1·07	...	2,241	106
Sagaing ...	6,650	8,154	1,820·0	4·38	3·57	0·42	...	2,241	421
Pakôkku ...	12,883	17,104	2,097·9	2·61	1·96	0·44	...	2,241	143
Minbu	7,631	9,932	2,529·0	5·30	4·07	1·88	...	3,137	608
Meiktila ...	...	...	...	...	...	...	...	2,690	2,690
II.—Topographical—									
Yenangyaung oil-field.	27,909	57,696	29,500·0	...	8·18	...	...	37,200	896
Minbu oil-field ...	2,213	12,898	6,063·7	...	7·52	...	...		
Yenangyat oil-field.	...	1,500	740·0	...	7·89	...	...		
Kabwet coal-field (Shwebo).	...	101,120	793·5	...	0·12	...	...	...	...
III.—Cadastral—									
Shwebo ...	8,590	9,502	6,585·7†	12·17	11·01†	3·97	9·75	16,862	3,710
Yamèthin ...	8,129	10,052	6,616·3†	13·02	10·53‡	3·54	8·09		
Total ...	85,264	240,277	60,940	6·92‡	5·69‡	2·57	8·92	69,649	8,709

The above includes the expenditure entailed on account of—

(a) *For Holding Surveys—*

(1) Demarcation of holding and kwin boundaries and preparation of registers of the same.

(b) *For Topographical Surveys of Oil-fields—*

(1) Triangulation with the theodolite.

(2) Demarcation and resurvey of private and State petroleum wells and preparation of registers of the same.

(3) Demarcation of village sites, religious lands, cultivation and preparation of registers of the same.

(4) Demarcation of lands surveyed into one square mile blocks.

(c) *For Cadastral Surveys—*

(1) Triangulation and traverse with the theodolite for area surveyed.

(2) Triangulation and traverse with the theodolite in advance for next field season.

(3) Demarcation of holdings, kwins, and circles, and preparation of registers of the same.

(4) Passage of six detachments from different scattered districts to ground of work.

(5) Purchase of necessary stores in the way of das, pich-axes, spades, camp furniture, &c., which will not recur again.

(6) Including recess season expenditure.

The cost of holding surveys compared with that of last year is given below :—

District.	Cost per acre in annas. 1889-90.	Cost per acre in annas. 1890-91.	Difference.	Average cost per acre for both years.	Remarks.
Mandalay	4·18	...	...	4·18	
Shwebo	3·69	4·28	+ 0·59	3·99	
Sagaing	3·30	3·57	— 0·38	3·74	
Ye-u	...	7·69	...	7·69	
Pakôkku	3·81	1·96	— 1·85	2·89	
Minbu	3·97	4·07	+ 0·10	4·02	
Meiktila	4·95	...	...	4·95	
Total ...	4·11	4·31	+ 0·20	4·49	

* Includes coal-field survey (Shwebo).

† Includes cost of area traversed in advance.

‡ Excluding Topographical cost.

That of Ye-u is high this year, owing to the detachment having been transferred from Minbu a distance of 350 miles, and loss of some 15 or 20 days by the non-receipt in time of survey instruments from Calcutta. The expenditure of Rs. 2,901-7-0 for Shwebo Holding and Topographical Surveys may be divided thus :—

		Acres.	Cost. Rs.	
16-inch scale Holding Survey	In Shwebo township ...	2,288	851	·7
	In Kabwet coal-field ...	5,592	1,256	·5
4-inch scale Topographical Survey.	In Kabwet coal-field and surrounding-lands. ...	101,120	793	·5
	Total ...	108,955	2,901	·7

The survey of 158 square miles of land applied for by the Shwebo Coal Mining Syndicate therefore cost Rs. 1,256 ·5 plus 793·5 or Rs. 2,050.

The cost rate per acre for 16-inch Topographical and Cadastral Surveys for each class of work may be said to be :—

Survey.	Cost per acre in annas. Triangulation and traverse.	Detailed survey.	Demarcation.	Remarks.
	(a)	(b)	(c)	
II.—*Topographical.*				
Yenangyaung oil-field	0·50	6·83	1·75	(a) For whole area triangulated, *i.e.*, that in advance of detail survey. (b) For whole area surveyed. (c) For cultivated area demarcated.
Minbu oil-field	0·75	6·51	1·50	
Yenangyat oil-field	1·00	6·82	...	
III.—*Cadastral.*				
Shwebo	1·50	7·60	0·80	
Yamèthin	1·00	7·09	1·15	

Owing to the bare hills and deep ravines of the oil-fields with no water to speak of and with the heat which was most excessive, the elaborate topographical work required could not possibly be executed cheaper. For the area cadastrally surveyed, the high cost rate could not but be expected, as it includes expenditure for other work besides survey as mentioned above. It was also due to the very short field season during the hottest part of the year, namely, April to June, and that the proportion of cultivation to waste for the entire area surveyed was :—

For Shwebo ... ... 1 to 0·106
For Yamèthin ... ... 1 to 0·237

As some of the items of expenditure will not recur again, the present rate cannot be accepted as a guide for the future, when it is anticipated that the cost of the local cadastral survey, including traverse and holding demarcation work, will be below 7 annas per acre.

Recess work.

14. The establishments will be employed in inking-in of the field maps, preparation of area statements in duplicate, copying of registers of holdings for District Officers, and copying of field maps by the kwin on transfer paper for lithography.

General remarks on, and description of, area surveyed.

15. The following gives the general remarks on and description of the area surveyed district by district.

(i) *Shwebo district.*—Of the area mapped on the 16-inch=1 mile scale, that in the Shwebo township comprised valuable paddy-fields depending on irrigation, and that in Chaukywa and Malè townships consisted of patches of paddy and village lands, situated in the different valleys of a forest clad undulating country of which a grant of 158 square miles has been applied for by the Shwebo Coal Mining Syndicate. This area of 158 square miles was surveyed in skeleton on the 4-inch=1 mile scale. Roughly calculating it contains about :—

10 square miles of coal-bearing strata ;
2 square miles of village-sites ;
6 square miles of cultivated land (paddy and ya) ;
10 square miles of culturable paddy-land now with tree jungle
50 square miles of culturable ya land now with bamboo and tree jungle ;
80 square miles of unculturable land covered ;

with small and medium sized forest trees of ingyin (*Aporosa macrophylla*), thitya (*Shorea obtusa*), sha (*Acasia catechu*), and a sprinkling of pyinkado (*Xyliadolabriformis*) thitsi (*Melanorrhæa usitala*), in (*Depterocarpus tuberculatus*), and kyun (*Tectonagrandis*) teak.

The boundaries are:—

On the North.—Along course of Mahantha chaung from its mouth to about 4½ miles, thence in a straight line to a post on Thayawgaing-Letpagaing cart road.

On the South.—A straight line due east, from a post in the village of Chinmyitchin to the mouth of the Yônbin chaung.

On the East.—The right bank of the Irrawaddy river from the mouth of Yônbin chaung to Mahantha chaung.

On the West.—A straight line north to south from post on Letpagaing-Thayawgaing road to post in Chinmyitchin village.

Gold in small quantities is said to be found in the Mahantha chaung and there appears to be iron ore in some parts of the tract. The ground being hilly transport is difficult, and there being thick jungle, chaining along the beds of streams during the months of December and January proved very unhealthy, and the small detachment employed here lost two men from malarial fever. The highest hill in the tract is Nat Taung situated 2 miles north-west of Kabwet village and it is 780 feet in height above mean sea-level.

(ii) *Saqaing district.*—The area surveyed comprised State paddy, ya, and kaing lands. Holdings being very small, the field-to-field system was here adopted like last year. Chief crops raised were paddy, pegyi, and pegya, other crops being cotton, sessamum, and vegetable.

(iii) *Ye-u district.*—Rich irrigated paddy-lands containing very small holdings were surveyed some 6 miles west of the town of Ye-u. The field bunds (kazins) were as a rule covered with jungle which impeded the detail work.

(iv) *Pakôkku district.*—The holding survey party worked the same as last year on alluvial lands along the bank of the Irrawaddy extending to the southern limit of the district. The crops raised were chiefly gourd, fruit, tobacco, paddy, pegyi, peyin, pelun, pebizat, and chillies. Wheat, gram, millets and maize were grown in smaller quantities.

The topographical survey detachment mapped the oil-bearing tract in the vicinity of Yenangyat village. It contained five valleys running east and west, namely, Yawnaung, Ôkkyaung, Ywaya, Ayadaw, and Seikkaw. The first three are with petroleum wells in use and abandoned well-sites which were mostly filled up. The wells number 140, of which there are 66 State and 74 claimed as private. In the fourth and fifth valleys there are surface indications of oil; in fact in Ayadaw a well was once dug in the Burmese times and showed signs of oil, but the villagers fearing that they would have to provide free labour for future wells in that neighbourwood reported that the digging ordered had proved a failure. The five valleys surveyed are very narrow, from ¼ mile to 2 miles in length, with steep sandstone and rocky hills 200 to 500 feet in height on either side. The oil obtained in them is much thinner than that of Yenangyaung and it is better for burning purposes than for lubricating.

(v) *Minbu district.*—The ground gone over by the holding survey party was near the Irrawaddy river and may be said to be of the same description as the alluvial lands of Pakôkku district, only that wheat and gram predominated here in the crops raised.

The oil-field tract comprised a strip of hilly country 2 miles broad running parallel to the Irrawaddy river at an angle of 28° 29′ west of the meridian, and it is 10 miles in extent from Minbu town to Tat Taung. The intention of the Government being to lease out the tract in uniform one square mile blocks, it has been demarcated accordingly, two squares falling to the north of Minbu being designated 1N and 2N, and the others south of Minbu 1S to 18S. In Block No. 2S half mile west of Minbu town are situated the extraordinary blue clay mounds known as the mud volcanoes, in the vicinity of which are to be found petrified sea-shells. These mounds Number five, and they stand from 10 to 25 feet in height, having every appearance of miniature volcanoes, only that they emit a clayey liquid with a strong petroleum odour instead of lava. Besides these, further north in Block No. 2N are many small springs of oil and water mixed. An oil spring exists also in Block No. 13S. The country in Blocks Nos. 1N, 2N, 1S, and 2S is undulating with few hill ridges, but that from 3S to 18S may be said to be only hills running in high ridges from north to south. In the vicinity of Minbu there are a few fields on which sessamum is now grown instead of paddy for want of sufficient rain water. There are also many orchards, with custard-apple, mango, wood-apple, and other fruit trees. Other cultivations in the tract surveyed are on the undulating lands here and there and they are of a shifting nature, the poorness of the soil not permitting more than one or two crops of sessamum or cotton being grown in the same place. The tree jungle which covers the hills is of apparently recent growth, trees met with being rarely more than 2 feet in circumference. This jungle furnishes firewood to the steamers of the Irrawaddy Flotilla Company. Bamboo is to be found in fair quantity in the valleys of the southern blocks. The details of the

area of 20 square miles demarcated as the Minbu oil-field, divided into occupied and unoccupied portions, are—

Area occupied in acres.					Area unoccupied in acres.			Total of occupied and unoccupied.
Cultivated.		*Uncultivated.*		Total.	Waste, chiefly hills.	Under water.	Total.	
Fields.	Gardens.	Towns and villages.	Religion.					
1,250	62	414	24	1,750	10,704	446	11,150	12,900

(vi) *Magwe district.*—Portion of the Yenangyaung oil-field, 13 miles in length by 2 miles in width falls within the Yenangyaung subdivision of this district, comprising 25·35 square miles. It extends from Kyigyi chaung on the south to a little byond the Pin chaung on the north, and takes in the well known petroleum wells of Twingôn and Bèmè situated in a direct line 2 miles east of Yenangyaung. Twingôn and Bèmè are 1 mile apart from one another, and the waste land between them known as Khodaung, which was granted to the "Burma Oil Company," has many successful oil borings conducted on the American principle. The two groups of oil wells constructed by the natives cover respectively about 200 acres by Twingôn and 75 by Bèmè. The oil-wells in each group are given below.

Name of native reserve.	Number of State wells			Number of private wells					Total number of wells and well sites in each.	Depth of working wells in feet.
	Working.	In disuse.	Total.	Working.	In disuse.	Under construction.	New well sites.	Total.		
Twingôn ...	24	105	129	262	55	42	115	474	603	135 to 285
Bèmè ...	14	21	35	71	57	1	10	139	174	100 to 260
Total ...	38	126	164	333	112	43	125	613	777	

The private wells are mostly owned by an exclusive set of Burmans, who call themselves twinzayos and who claim their rights by continuous possession for about nine centuries. Others who own wells had purchased their rights from these people. There are 24 twinzayo families represented by:—

Serial No.	Name of twinzayo.	Name of ancestor.				Right how acquired.		Remarks.
		Father or mother.	Grandfather or mother.	Great grandfather or mother.	Great great grandfather or mother.	By inheritance.	By purchase.	
1	Maung Po Naing ...	Maung Kyaw Din ...	Maung Yo ...	Maung Lôk ...	Maung San Lha Baw...	Inheritance ...	...	
2	Maung Chan Yan ...	Maung Pa Thi ...	Maung Naung ...	Maung Kala ...	...	ditto ...	...	
3	Maung Aung Myat ...	Maung Po ...	Maung Nan Thi ...	Maung Te ...	...	ditto ...	...	
4	Ma Lha Ya ...	Ma U Zan ...	Ma E Gyi ...	Ma Kaung Tha ...	...	ditto ...	...	
5	Maung Lu Gyi (Galè)...	Maung Pwa ...	Maung Shwe Yan ...	Maung Ngon ...	Maung Lha Baw ...	ditto ...	...	
6	Maung Po Ngwè ...	Maung Min Din ...	Maung Shwe Swe ...	Maung Mhaing Gyi ...	...	ditto ...	...	
7	Maung Po Maung ...	Maung Tha Dun ...	...	...	...	...	(a) Purchase...	(a) Bought from Twinzayo Maung Wa, son of Maung San Lha Baw, son of Maung Chit Bet.
8	Maung Tha Zin ...	Maung Kyaw Zan ...	Maung Myat Tha Dun	Maung Zaya ...	Maung Tha Aung ...	Inheritance ...	...	
9	Ma In	...	...	...	...	(b) ditto ...	...	(b) Inherited from her aunt Ma Pu Lè.
10	Ma E Nyo... ...	Ma Shwe Thi ...	Ma Mhon ...	Ma Thu	...	ditto ...	...	
11	Maung Chit Po ...	...	...	...	...	...	(c) Purchase	(c) Bought from Twinzayo Maung Thet Kywin.
12	Maung Ngwè Zin ...	Maung Aung Min ...	Maung Pyi ...	...	...	Inheritance ...	...	
13	Ma Shwe Mya ...	Ma Ein Gyi ...	Ma E Mya ...	Ma Di	...	ditto ...	...	
14	Maung Lu Pein ...	Maung Shwe Lha ...	Maung San Baw ...	Maung Tha Kaing ...	...	ditto ...	...	
15	Maung Aung Gyi ...	...	...	...	...	...	(d) Purchase	(d) Bought from his uncle Maung Sit Pu.
16	Maung Tha Kado ...	Maung Kan Gyi ...	Maung San Lhauk ...	...	...	Inheritance ...	...	
17	Maung Bu ...	Maung Shwe So ...	Maung In ...	Maung Nyo ...	...	ditto ...	...	
18	Ma Kun Gya ...	...	Ma Ke	Ma Ku	...	ditto ...	...	
19	Maung Tun U Galè ...	Maung Kyi San ...	Maung Kyaw Dan ...	...	...	ditto ...	...	
20	Maung Ba ...	Maung U ...	...	...	...	...	(e) Purchase	(e) Bought from Twinzayo Maung Taung Bo.
21	Maung Yo Zet ...	Maung Galè ...	...	...	...	...	(f) ditto ...	(f) Bought from Twinzayo Maung Kywè.
22	Ma Khin (Kyimyin Mibaya).	...	...	...	...	(g) Inheritance	...	(g) Inherited from her aunt Ma O.
23	Maung Pu Ni ...	...	Maung Nan Aung ...	...	...	ditto ...	...	
24	Maung Lu Gyi (Gyi) ...	Maung Shwe Thi ...	Maung Shwin ...	Maung Kwe ...	...	ditto ...	...	

The above information, furnished by A. Gaitskell, Esq., C.S., Assistant Commissioner, Subdivisional Officer, Yenangyaung.

The twinzayos, also called yoyas, claim to be the direct descendants of the original settlers of Yenangyaung, which was known in the tenth century as Kyaukkamyo (city surrounded by rocks). Their rights to the produce of Twingôn and Bèmè (recently reserved as native areas*) are said to have been granted to their forefathers by the Pagan King Alaungsithu Mingyi on the 9th day of the waxing of the moon of the month of Pyatho 460 B.E. (January 1098 A.D.) when the King was on a visit to Yenangyaung, and it is said on the very day the Yenan (petroleum) was first discovered. If the above statement is to be relied on the profits accruing from the sale of the oil were originally intended by the King to be devoted to certain *Natseins* (spirits of those dying from unnatural causes). So long as there were few shafts sunk the practice of devoting all profits of the crude oil to the nat deities was carried on. In course of time, however, as civilization advanced and the demand for oil became greater day by day, the number of wells and the profits accruing therefrom increased and both King and people for some generations past have had the lion's share of the profits, the nats getting little if any. The legend connected with these oil tracts may not be out of place here as the twinzayos base their rights on it. It runs briefly as follows :—

"During the reign of Poppa Saw Rahan, the eleventh King of Pagan, in the year 2 B.E. (A.D. 640) the Myothugyi of Kyaukkamyo† and his relatives dug a large tank about 2 miles east of their town for the benefit of the inhabitants. This tank was called Myittakan, *i.e.*, constructed to gain merit. Before its completion an earthquake occurred and on the ground cracking about the tank it filled with highly perfumed waters (Yenathasi), which attracted thousands of pilgrims and proved a source of great benefit to the Myothugyi and his family. It was subsequently prophecied by a Rahan (pôngyi) named Ponnawada Mati, that at the command of a King the perfumed waters of Yemathasi would lose their sweet scent and be changed into an oily liquid emitting a noxious odour and hence forward be known by the name of Yenan, but these effects far from causing any distress to descendants of the Myothugyi who would be 24 in number would on the contrary benefit them greatly, as the Yenan would be of great demand for preserving pezas (palm leaf with sacred writings) and for illuminating pagodas and temples. The years rolled and the time for the fulfilment of the prophecy was at hand. The King Alaungsithu Mingyi of Pagan having heard that Kyaukkamyo† was a famous town and contained many wonders, made up his mind to pay the place a visit. Accordingly he left Pagan on the 4th day of the waxing of the moon of the month of Pyatho 460 B.E. (January 1098 A.D). with a retinue as per margin and on the 7th of the same month landed at Kyaukkamyo.‡ On arrival he lost no time in fulfilling his desire of visiting the wonders of the place. On the 8th on returning from one of these excursions in the evening he discovered that seven of the ladies named the Myozas of Nyaungôk, Nyaungywè, Salè, Tilin, Kyabin, Popa, and Nyaungyan, and the eunuch Kye Ponna of his establishment were missing. He was much enraged and went immediately in search of them. He reached a hill called Thuwunnagire and there tarried for the night being entertained by a Zawgyi (magician) who resided there. Hence that hill is called Minlindaung to this day. The next morning the 9th he discovered the truants in high glee on the banks of the lake of scented waters. Enraged at the sight he killed them. They immediately turned into Natseins. When his passion had cooled down and he had meditated on the crime he had committed he blamed the Yenathasi as the cause of it. So calling to his aid the miraculous powers which he possessed he changed the perfume of the waters into its present malodorous state. From that day to the present it is known as Yenan. On the 10th the King attempted to leave Kyaukkamyo, but none of his rafts would move and on consulting his wisemen he was told that the Natseins desired to be provided for and would not allow him to proceed till he had made provision for them. A meeting with the nats was arranged and an amicable settlement was come to by which the King agreed that the proceeds of the sale of the Yenan were to be devoted to the eight Natseins. The King also commanded that the Yenan producing soil be only within a certain area, which was to be held by the yoyas, and that the limits of such lands be laid down by drawing a straight line from a place called Thelagaza or Kyauksin (rock elephant) to Thuwunagire (Minlindaung Hill), then from the centre of this line to mark off two points, one on the east and one on the west, at the same distance as from this centre to Minlindaung, and that the boundary be from Kyauksin to the point on east, thence to Minlindaung, thence to the point on west, and thence to Kyauksin. After these commands the King was able to leave for Pagan, reaching it on the 14th of that month."

28 ladies under charge of an eunuch designated Kyo Ponna.
100 boa and wisemen.
80,000 troops rank and file.
12 towing boats and Royal rafts.

The twinzayos firmly believe in the above, and the tradition of their rights to a share of the Twingôn and Bèmè land produce seems to have been recognized by the different Kings of Burma from century to century. Thus it is that they have been and are still disputing the demarcation of our boundaries.

The area surveyed and demarcated beyond Twingôn and Bèmè follows a bearing of 331° 44′ 30″ as pointed out by Dr. Fritz Noetling of the Geological Survey of India as the oil-bearing strata line, and strange to say this direction coincides with the line from Minlindaung to Kyauksin, said to be described by the King Alaungsithu Mingyi in A.D. 1098. The tract has been, like that at Minbu, portioned off into one square mile blocks, those north of Twingôn being designated 1N. to 8N. and those south of Bèmè 1S. to 16S. The lands are all of sandstone formation and are one may say void of jungle, a few cacti and some thorny brushwood being seen here and there. The area of the Yenangyaung oil-field within Magwe district as divided into occupied and unoccupied portions is as follows :—

* Twingôn about 295 acres and Bèmè 342. | † Yenangyaung.

Area occupied in acres.					Area unoccupied in acres.			Total of occupied and unoccupied.
Cultivated.		*Uncultivated.*		Total.	Waste chiefly.	Under water.	Total.	
Fields.	Gardens.	Villages and towns.	Religion.					
1,123	259	281	12	1,675	14,287	265	14,552	16,227

The cultivation found is chiefly sessamum on the highlands and onions in the bed of the Pinchaung. On the banks of this stream topes of valuable palmyra palm abound.

(*vii*) *Myingyan district.*—The northern section of the Yenangyaung oil-field falls within the Pagan subdivision of this district, and it extends from the Pinlchaung to Singu. The demarcated square mile blocks are numbered 9N to 59N. The oil-bearing strata as given by Dr. Fritz Noetling was followed for 2½ miles, and changed at his request to 351° until the survey closed at Singu. The area surveyed in this district is 64·80 square miles and the table below shows the occupied and unoccupied portions. The ground is much cut up with deep ravines in the vicinity of Pin chaung and Singu, while midway between these it was chiefly tableland covered with cultivation of oats (the staple food of inhabitants of the highlands here), sessamum, millets, and maize.

Area occupied in acres.					Area unoccupied in acres.			Total of occupied and unoccupied.
Cultivated.		*Uncultivated.*		Total.	Waste chiefly.	Under water.	Total.	
Fields.	Gardens.	Villages and towns.	Religion.					
14,689	...	99	64	14,852	26,279	338	26,617	41,469

Conduct of senior men of the establishment.

16. Myoôk Maung Ba On, Probationer, Land Records Department, was indefatigable in all he undertook to do. His knowledge of theodolite surveying was put to good use at Shwebo. Myoôk Maung Po U, who has just joined the office, has a thorough knowledge of cadastral surveying and has worked well in the drawing office. Survey Inspectors Maung Po Dôk, Maung Po Lha, Maung Po Kyin, Maung Kha, Maung Lu Gyi, Maung Maing, and Maung Gauk have given every satisfaction; the three first named work particularly well. Survey Inspector Maung Ne Myo of Shwebo gave satisfaction on taking the field, but subsequently, when placed under Maung Ba On's orders, neither his conduct nor work met with approval. He has been warned.

Survey schools.

17. Survey schools were established in April 1890 at Kyauksè, Sagaing, Yamèthin, and Minbu, and in November 1890 at Mandalay. The number of pupils who have obtained the pass certificate under section 17 of the Upper Burma Survey Class Scheme at competitive examination held to date, are as follows :—

Kyauksè	12
Sagaing	16
Yamèthin	3*
Minbu	...
Mandalay	13
Total ...	44

Programme of work for next field season.

18. During 1891-92, unless otherwise ordered, there will be three parties employed. One on the completion of the Yenangyat Oil Field Survey (now in hand), and the other two on the extension of the cadastral survey of the irrigated fields of Shwebo and Yamèthin, which was started last April.

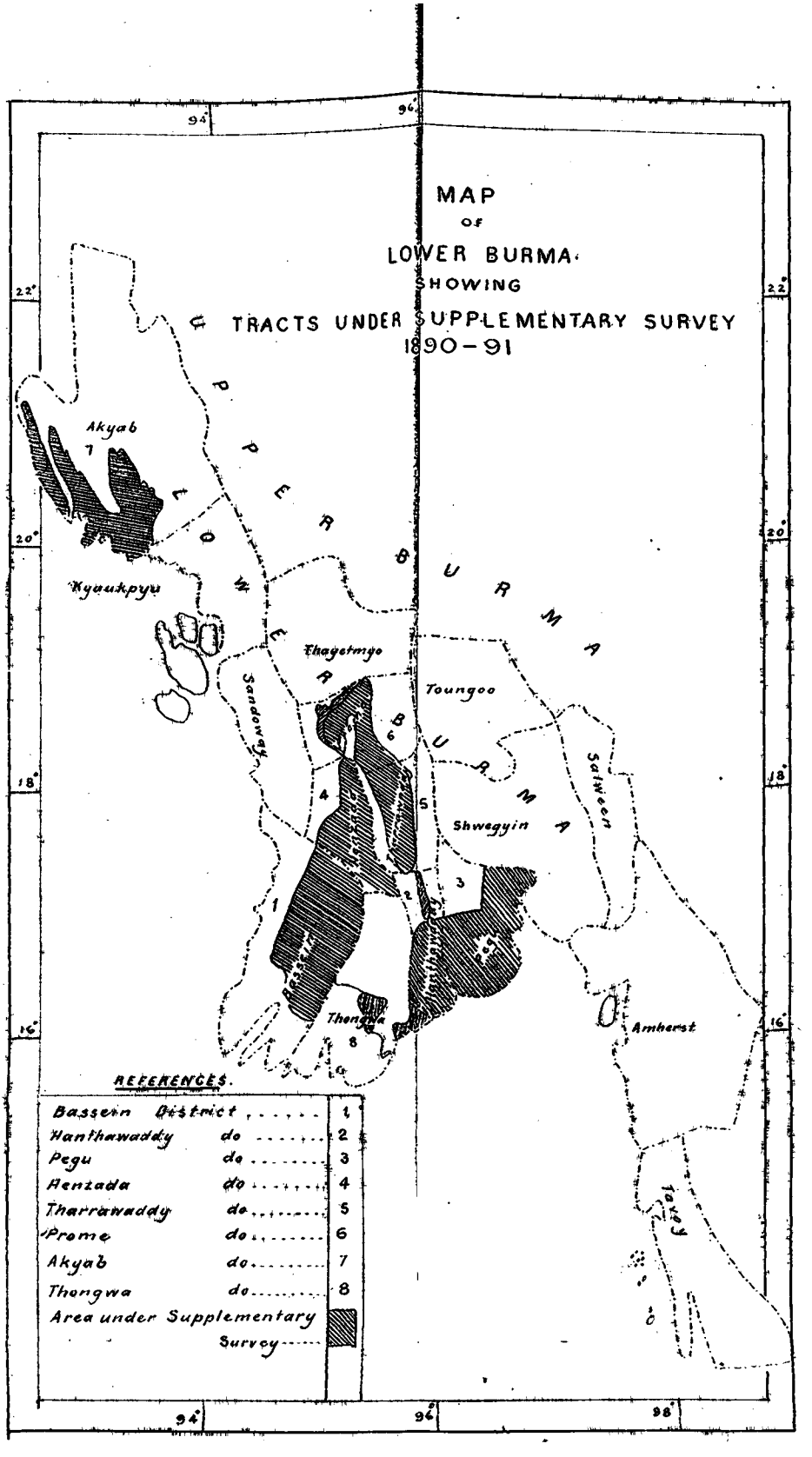
19. Statements appended are :—

The 11th August 1891.

R. A. GIBSON,
Extra Assistant Commissioner.

* Two other pupils passed at Toungoo and obtained the Lower Burma certificate.

G. B. C. P. O.—No. 3767, D., L. R. & A., 8-12-91—380.


MAP
OF
LOWER BURMA.
SHOWING
TRACTS UNDER SUPPLEMENTARY SURVEY
1890-91
UPPER BURMA
LOWER BURMA
Akyab
Kyaukpyu
Thayetmyo
Toungoo
Sandoway
Shwegyin
Salween
Thongwa
Amherst
Tavoy
94°
96°
98°
22°
20°
18°
16°
REFERENCES.
Bassein District 1
Hanthawaddy do 2
Pegu do 3
Henzada do 4
Tharrawaddy do 5
Prome do 6
Akyab do 7
Thongwa do 8
Area under Supplementary Survey.....

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1891-92.

RANGOON : PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, BURMA. OCTOBER 1892.

[Price,—Rs. 1-8-0.]

133618

TABLE OF CONTENTS.

RESOLUTION BY THE CHIEF COMMISSIONER.

	Para.	Page.
Report of Director how dealt with ...	1	1
Maintenance of the village records. Lower Burma	2	ib.
Upper Burma	3	2
Re-organization of the Land Records Department	4	ib.
Surveys by Local Agency	5	ib.
Surveys by the Imperial Department	6	3
Agricultural experiments	7	ib.
Services of officers	8	4

REPORT ON THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BURMA, FOR THE YEAR 1891-92.

SECTION I.

MAINTENANCE OF THE VILLAGE RECORDS.

	Para.	Page.
Area under supplementary survey	1	1
Assessments in the area under supplementary survey	2	ib.
Cost of operations	3	2
Appointment of probationers, Land Records Department	4	3
Land Records staff	5	ib.
Supplementary survey	6	5
Conduct of the Inspectors	7	6
Superintendents	8	7
Inspection of supplementary survey by Deputy Commissioners, Subdivisional Officers, and Township Officers	9	ib.
Inspection by the Director	10	8
Records in the possession of thugyis	11	ib.
Permanent survey marks	12	9
Tracts which will be necessary to re-survey at the end of the term of settlement	13	ib.
Supplementary survey, Mandalay	14	10
Thugyis' records in unsettled circles	15	ib.
Survey.		
Cadastral survey by local agency	16	11
Traverse work undertaken by the Local Agency Party	17	ib.
Organization of traverse work	18	12
Field operations and results	19	ib.
Field work of the cadastral section of the Local Agency Party	20	13
Myoôks and Inspectors	21	14
Holding-marking	22	ib.
Increase in area and revenue due to the year's operations	23	ib.
Correctness of the work	24	ib.
Special potta survey, Pegu district	25	15
Surveys by local agency in Upper Burma	26	ib.
Survey by the Survey of India Department	27	17
Survey schools	28	ib.

SECTION II.

ANALYSIS OF DISTRICTS WITH REFERENCE TO SECURITY AGAINST FAMINE.

Security against famine	29	18

SECTION III.

FODDER RESERVES AND ARBORICULTURE.

Grazing-grounds	30	18

SECTION IV.

AGRICULTURAL EXPERIMENTS.

Lashio experiment farm	31	18
Dairy farm	32	19
Sheep farm	33	ib.
Distribution of seeds	34	ib.
Mergui experimental plantation—		
Coffee	35	21
Cocoa		
Vanilla		
Tea		
Pepper		
Agricultural shows	36	ib.

SECTION V.

Veterinary Establishment and Cattle-breeding.

	Para.	Page.
Veterinary Assistants— Veterinary school ... ... Cattle disease ... ... Breeding operations	37	22

SECTION VI.

Weekly crop reports and monthly statements of rainfall	38	22

SECTION VII.

Trade registration	39	23
Crop estimate	40	ib.

SECTION VIII.

Acknowledgment of services	41	23

APPENDICES.

	Page.
Circulars	iii.
A.—Area under supplementary survey and cost of the operations	v.
B.—Assessments in the tracts under supplementary survey	vi.
C.—Agency by which the supplementary survey was conducted	ib.
D.—Supplementary survey inspection	ib.
E.—Result of corrections	vii.
F.—Table showing the nature of errors found by the Superintendents and Inspectors ...	vii—ix.
G.—Condition of the permanent survey-marks	ix.
H.—Thugyis' commission and thugyis' assistants' salaries	x.
I.—Survey examinations in Lower Burma	xi.
Extracts from the report on the operations of the Lower Burma Field-to-field survey by Local Agency Party for the year 1891-92	xii.

RESOLUTION

ON THE

REPORT ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1891-92.

Extract from the proceedings of the Chief Commissioner in the Revenue Department, No. 1R.—7, dated the 10th November 1892.

READ—

Letter No. 527-235R., dated the 21st October 1892, from the Secretary to the Financial Commissioner forwarding the report of the Director of Land Records and Agriculture, Burma, for the year 1891-92.

RESOLUTION.—Hitherto the report of the Director of Land Records has been reviewed in the Resolution on the Revenue Report. It is now dealt with separately in accordance with the orders communicated in letter No. 215-37, dated the 1st February 1892, from the Secretary to the Government of India in the Revenue and Agricultural Department.

Maintenance of the village records. Lower Burma.

2. The area under Supplementary Survey in 1892 increased by 2,561 square miles, the increase being due partly to the operations of Local Survey Parties, partly to the settlement operations which have been in progress for some years in the Bassein and Thôngwa districts. The Akyab district and almost the whole of the Irrawaddy and Pegu divisions, excluding the Thayetmyo district, are now under Supplementary Survey. The average cost per square mile of the operations decreased from Rs. 8-11-8 in 1890-91 to Rs. 7-12-9 in the year under review. The total cost for the province was Rs. 1,09,141 against Rs. 99,889 in the previous year. This cost is very moderate for the amount of work done which consists, practically, in keeping up to date the cadastral maps of the greater part of Lower Burma, besides checking assessments and supervising the maintenance of village records by thugyis. Judged by statistics of inspections the work of the supplementary staff improved considerably during the year under review. Except in Thôngwa, where the Superintendent was for a time incapacitated by illness, more checking was done by Superintendents in every district than in the previous year. There was also a large increase in both the gross and the average number of kwins checked by Inspectors, except in Prome, where there was a considerable, and Akyab, where there was a slight, decrease. As the Director remarks the amount of work done in Prome was inadequate and the Officiating Chief Commissioner expects to see an improvement in future years. There was a great increase in the amount of checking done by the Deputy Commissioners, particularly in Pegu, Hanthawaddy, Tharrawaddy, Prome, and Henzada. It is creditable to the Deputy Commissioners of these heavy districts that they were able to find time to do so much inspection. The work of Subdivisional Officers was not so satisfactory, although they did more checking than in the

previous year. The average number of kwins checked by each officer was 8 only against an average of 23 in the case of Deputy Commissioners. Subdivisional Officers should certainly do as much checking as Deputy Commissioners, and Mr. Fryer hopes the Deputy Commissioners will see that they do so in future. The number of kwins checked by Township Officers was much larger than in the previous year, being 409 against 279 in 1890-91. It was, however, inadequate in the Tharrawaddy, Prome, Bassein, Akyab, and Thôngwa districts. The Chief Commissioner will look for improvement in this respect from the Township Officers of the districts mentioned. The work of thugyis appears on the whole to have been better than in the preceding year, but they are still very far, as a body, from reaching the standard of efficiency which they must possess in order to take the part assigned to them in the existing revenue system of the province. Under this system one of the most important of the duties of a thugyi is to keep the maps and records of his circle up to date. But only 159 out of the 331 thugyis employed in tracts under Supplementary Survey performed any part of this duty. In the cases of the remaining thugyis the work was done by the Supplementary Survey Department. The general unfitness of thugyis to perform this part of their duties is a strong argument for the abolition of the present thugyi system and for the introduction, in its place, of a system under which the revenue is collected by the village headmen and the work of maintaining maps and registers is entrusted entirely to the Supplementary Survey Department. As has been mentioned in paragraph 16 of the Resolution on the Revenue Report this new system is now being gradually introduced throughout Lower Burma.

Upper Burma.

3. Supplementary Survey operations were carried on during 1891-92 in a small portion of the Mandalay district. The operations are practically confined to keeping the survey maps up to date as the area dealt with has not yet been properly settled and assessment rates have not been imposed. Settlement operations are now in progress in Mandalay and it is proposed, when these have been completed and rates of assessment have been fixed, to introduce the same Supplementary Survey system as is in force in Lower Burma.

Reorganization of the Land Records Department.

4. The question of the reorganization of the Land Records Department was under consideration during the year. Hitherto Superintendents of Supplementary Survey have been members of the Subordinate Civil Service and no regular system has been followed in recruiting and training them. This want of system is productive of inconvenience, which becomes greater every year as the operations of the department extend and additional officers are required. It has accordingly been decided to form a separate Land Records Department composed of Superintendents, who will be gazetted officers, and of Inspectors, clerks, and menials who will be non-gazetted. The scheme also provides for the entertainment of three probationers who will be trained, as probationers, for the post of Superintendent, and will be advanced to such posts as vacancies occur. The scheme submitted by the Chief Commissioner has recently been sanctioned by the Secretary of State for India and the new department is now being organized.

Surveys by local agency.

5. During 1891-92 cadastral surveys were carried on by the Imperial Department and by local agency. The Local Survey Parties in Lower Burma are employed, as is explain-

ed in paragraph 8 of the Resolution on the Revenue Report of 1890-91, in surveying small areas in various districts which were omitted from survey by the Imperial Department. During 1891-92 these parties performed traverse surveys for the first time as well as cadastral surveys. The total area surveyed by the traverse parties was 1,587, the total area cadastrally surveyed 1,566 square miles. The cost of the traverse was Rs. 46 and of the cadastral survey was Rs. 58 per square mile. The cost of the cadastral survey in 1890-91 was Rs. 67. The net result of the surveys executed in 1891-92 has been an increase in area of, in round numbers, 66,000 acres and an increase in revenue of Rs. 1,10,077. These results reflect much credit on Mr. Clancey, who has general charge of the operations. The surveys carried on by local agency in Upper Burma consisted of the survey of small tracts of oil-bearing land in the Southern Division and of the survey of State lands in the Shwebo and Yamèthin districts. The area surveyed in these latter districts was 125 square miles at a cost of Rs. 21,065. The cost of the survey, both cadastral and traverse, was Rs. 169 per square mile, a result which is satisfactory when the difficulties of the work are taken into consideration. In paragraph 6 of its letter No. 215-37, dated the 1st February 1892, the Government of India asked for information as to the remunerativeness of these surveys. As the Director points out in paragraph 26 of his report, the increase in revenue resulting from the survey cannot be stated because the revenue is at present calculated on the produce, *i.e.*, Government takes a certain proportion of the value of the produce of State land. It is proposed, however, to supersede this system by a system of fixed rates determined after enquiries by Settlement Officers. The great difference between the area returned by local officials and the area ascertained by survey shows that a survey is an essential preliminary to a regular settlement of the revenue.

Surveys by the Imperial Department.

6. Three survey parties were employed during the year—one in Upper, one in Lower, and one partly in Upper and partly in Lower Burma. The total area surveyed consisted of 1,632 square miles traversed in Lower and 3,272 traversed in Upper Burma, and 1,010 square miles cadastrally surveyed in Lower and 2,602 square miles so surveyed in Upper Burma. The total cost of the surveys was Rs. 6,91,800. At the beginning of the year a general survey scheme was drawn up for Upper Burma, under which the whole province is to be cadastrally surveyed by 1900, with the exception of the Katha, Bhamo, Ruby Mines, and Upper Chindwin districts. It is proposed that the settlement of Upper Burma should proceed *pari passu* with the survey, and the Officiating Chief Commissioner is about to address the Government of India on the subject of the provision of officers to perform the work. It is estimated that five Settlement and five Assistant Settlement Officers will be required from 1894 onwards, and it will probably be necessary to increase temporarily the cadre of the Commission in order to provide this staff.

Agricultural experiments.

7. Agricultural experiments on a considerable scale were carried out during the year at Lashio in the Northern Shan States. A farm of an area of 167 acres has been established at his station under an officer who has received a special training. The main object with which the farm was established was the introduction of wheat. The efforts to introduce this staple have so far failed, but they will be continued and

may ultimately prove successful. In addition to experimenting with crops, the Superintendent maintains a dairy and sheep farm. These were very successful during the year under review, and the success reflects credit on the Superintendent. Wheat and maize seed was distributed to cultivators in various districts of Upper Burma in the hope that the cultivators would take to the cultivation of these staples. These hopes do not appear to have been realized except in the Southern Shan States, where the Superintendent and Political Officer takes a great interest in agricultural matters and is sanguine of the ultimate success of his efforts to introduce wheat, potatoes, and a variety of English fruit trees and vegetables. A small experimental garden is maintained at Mergui, in which various crops are grown. It is not stated whether the experiments conducted there have had any result in inducing agriculturists in the neighbourhood to take to the cultivation of new staples. Agricultural shows were held at various places in Upper and Lower Burma and appear to have been generally a success.

Services of officers.

8. The appointment of Director of Land Records was held by Mr. Wilson during the year. The Officiating Chief Commissioner has pleasure in acknowledging the efficiency and energy with which he administered all branches of the deparment under his charge.

By order of the Chief Commissioner,

C. G. BAYNE,
Secretary.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1891-92.

SECTION I.

MAINTENANCE OF THE VILLAGE RECORDS.

Supplementary Survey, Lower Burma.—During the year the following areas were brought under supplementary survey for the first time :—

District.	Number of circles.	Area in square miles.
Pegu	1 ...	1
Hanthawaddy	2 ...	342
Tharrawaddy	2 ...	115
Prome	9 ...	465
Bassein	6 ...	231
Henzada	6 ...	383
Thôngwa	14	1,024
Total ...	40	2,561

The area shown in Pegu consists of two kwins of a circle which have been surveyed some time, and of which maps and registers have been kept up annually, but which have not hitherto been included in the returns.

The area in Thôngwa is that which was settled during the year 1890-91 by Mr. Mathews. In the remaining districts the areas are those which were surveyed by the Local Agency Party under Mr. Clancey during the year 1890-91.

The area under supplementary survey in Akyab remained unchanged.

Assessments in the area under supplementary survey.

2. Certain discrepancies in the figures for assessments this year having led to enquiries, it was found that in previous years certain districts had included cess and others had excluded it. In the figures attached to this year's report cess is included in all cases.

The increase in revenue in Pegu in the area under supplementary survey was Rs. 27,969. Of this sum Rs. 18,500 is due to increased rates of assessment which came into force this year in the circles of Meyinzaya and parts of Payagalè and Payagyi. The balance is due to extensions of cultivation, and in a small measure to pottas falling under assessment for the first time during the year. The increase would have been greater but for the increase in fallow area. The area shown as fallow is 54,078 acres against 39,931 acres last year. The causes of the large increase were chiefly unfavourable rainfall at the time of sowing and severe mortality amongst cattle.

The figures given for Hanthawaddy for 1890-91 do not include the revenue which was assessed by the thugyis in the two circles which were brought under supplementary survey for the first time during the year under report. In the two circles referred to, there was a large increase in area and revenue owing to their having been surveyed cadastrally by the Local Agency Party and to their being brought under supplementary survey.

In the same way, in Tharrawaddy the revenue of the two new circles is not included in the figures for 1890-91 ; this was Rs. 18,343. The increase in the assessment of these two circles, due to their being brought under supplementary survey, is Rs. 3,750. In the remaining 25 circles under supplementary survey, the increase in the revenue of paddy-land is Rs. 24,506, while there is a small decrease of Rs. 918 in the revenue assessed on garden and miscellaneous land. The increased revenue on paddy-land is due to extensions of cultivation, the

assessment of pottas of which the term of exemption had expired, and to a decrease in the fallow area from 32,345 acres in 1890-91 to 27,847 acres in the year under report. The Superintendent of Land Records, Prome, has not given any details as to whether there has been an actual increase in assessments when the same circles are compared in the two years.

In Bassein, in the 51 circles which were under supplementary survey last year, there was an increase of Rs. 1,30,545 in the assessment, while in the six new circles the assessments, as shown by supplementary survey, are Rs. 7,125 in excess of those made by the thugyis in the previous year. The increases in Bassein are due to—

(i) enhancement of rates in the townships of Legyi and Kyonpyaw;
(ii) assessment on expired grants amounting to 3,363 acres;
(iii) extensions amounting to about 20,414 acres;
(iv) a large decrease of 20,180 acres in the fallow area;
(v) assessment on 2,154 acres of cultivation in grazing grounds.

Notwithstanding that the fallow area has largely decreased, it is still abnormally large, namely, 102,492 acres, or rather more than one-fifth of the total area under paddy. This large area is almost entirely due to the effects of the severe epidemic of cattle-disease last year and to the outbreaks in Myaungmya and Ngaputaw which occurred this year.

In Henzada there is a large increase in the assessment on paddy-land. This is due mainly to the increase in the area under supplementary survey, due to the addition of the six circles surveyed by the Local Agency Party. In seven circles too, enhanced rates were applied for the first time during the year; this caused an increase in revenue of Rs. 25,200. Ordinary extensions of cultivation and a decrease in the fallow area from 19,010 acres last year to 13,831 acres in the present year, account for the remainder of the increase.

The decrease in the revenue assessed on garden and miscellaneous crop land notwithstanding the increase in the area dealt with, is due to the fact that as the revenue on kaing (miscellaneous) cultivation was not collected till after March 31st, it was not included in the figures for the present year, though it was included last year.

Last year, in Thôngwa there were only five circles under supplementary survey; this year there are 19. In the five old circles the increase in assessments on paddy-land is Rs. 21,193 and on garden land Rs. 1,822. As stated above, the 14 new circles have only just been settled. Comparing the assessment for the present year as obtained by the supplementary survey with the assessments as calculated at settlement, the former shows an increase of Rs. 10,355 on paddy-land and a decrease of Rs. 1,922 on garden and miscellaneous cultivation. If the present year's assessments be compared with the assessments as given by the thugyis last year, the former shows an increase of 49 per cent. on paddy-land and 39 per cent. on garden and miscellaneous land.

The increases are due to extensions of paddy cultivation and to a large extent to a decrease in the fallow area, which was shown last year by the thugyis as 12,933 in the 14 circles, while this year only 3,458 acres are shown as fallow in those circles.

The causes of the increase of Rs. 30,382 in the total revenue demand in Akyab are stated to be—

(i) assessment of time-expired potta lands;
(ii) extension of cultivation;
(iii) decrease in the fallow area;
(iv) the resumption and assessment of the Mabyandaung grant.

Cost of operations.

3. The cost of the operations rose from Rs. 99,889 to Rs. 1,09,141, but the cost per square mile decreased from Rs. 8-11-8 to Rs. 7-12-9. The cost per square mile has decreased in every district, except Pegu and Bassein, owing in most cases to the large increase in the area under supplementary survey. In Pegu, although the cost per mile has slightly increased, the cost per acre assessed has decreased. In Hanthawaddy the cost per acre assessed has increased owing to the increase in the Superintendent's pay and to increments in the pay of establishment.

4. At the beginning of the present year there was one post of probationer for the Land Records Department. This was held by Maung Ba Ôn on a salary of Rs. 100 per month, and he was working under Mr. Gibson in Mandalay. It is necessary that all Superintendents of Land Records should have a good knowledge of English, and on this account it is impossible to promote Inspectors to Superintendent, because, speaking generally, none of them know English. A special training is necessary for the work of a Superintendent, and in order to have a small reserve of officers capable of taking up the post of Superintendent when required, during the year a proposal was made, and sanctioned by the local Government, that two additional posts of probationer should be created. During the year Maung Ba Ôn, the first probationer, was appointed Superintendent of Land Records in Henzada, and accordingly three new men, Maung Kyi Ô, B.A., Maung Pe Maung, and Mr. Wood were appointed probationers, and were posted to Bassein, Thôngwa, and Pegu respectively, to learn their work under the Superintendents of those districts. All are reported to have worked well and to have gained a competent knowledge of their duties both in the field and in the office.

Appointment of probationers, Lands Records Department.

5. During the year a Superintendent was appointed in the Thôngwa district and the staff of Inspectors was raised from one to four, owing to the largely increased area coming under supplementary survey. In Prome the District Revenue Inspector was appointed to act as an Inspector of Land Records, as practically the whole of the district is now under supplementary survey. An additional Inspector was also appointed in Bassein, where the area under supplementary survey is very large and the work very heavy; the total number of Inspectors in Bassein was thus raised to eight.

Land Records staff.

The following table gives the number and salaries of each class of official connected with the supplementary survey:—

Statement showing the number and salary of each class of official connected with supplementary survey.

District.	Area of tract under supplementary survey.		Salaries of Superintendents.	Inspectors.				Thugyis.				Thugyis' Assistant Surveyors.				Remarks.
	Gross area.	Area assessed or held under temporary exemption.		Number.	Salary.	Average area of tract under each Inspector.	Average area assessed or held under temporary exemption under each Inspector.	Number.	Average annual earnings.	Average area of circle.	Average area assessed or held under temporary exemption in each circle.	Number.	Salary.	Average area of tract under each Surveyor.	Average area assessed or held under temporary exemption under each Surveyor.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Sq. m.	Acres.	Rs.		Rs.	Sq. m.	Acres.		Rs.	Sq. m.	Acres.		Rs.	Sq. m.	Acres.	
Pegu	2,019	792,028	450	4	60 to 100	505	198,007	38	2,472	53	20,843	48	18,570	42	16,501	The holdings are largest in Pegu, Hanthawaddy, and Thôngwa and smallest in Prome. The work is most difficult in Tharrawaddy, Bassein, and Thôngwa.
Hanthawaddy	1,818	550,715	500	4	60 to 100	454	137,679	37	2,072	49	14,884	36	14,233	50	15,298	
Tharrawaddy	1,211	349,844	250	4	50 to 80	303	87,461	27	1,284	45	12,957	41	13,962	29	8,533	
Prome	1,266	293,763	300	4	60 to 80	316	73,441	49	631	26	5,995	41	12,558	31	7,165	
Bassein	2,603	599,228	350	8	50 to 100	325	74,903	40	1,714	65	14,756	60	20,944	43	9,987	
Henzada	1,785	411,729	200	5	50 to 80	357	82,346	47	1,097	38	8,760	40	13,957	44	10,293	
Akyab	1,839	487,261	225	5	50 to 100	368	97,452	74	880	25	6,585	52	21,782	35	9,370	
Thôngwa	1,461	222,684	225	4	50 to 80	365	55,671	19	1,778	77	11,720	19	6,180	77	11,720	
Total ...	14,002	3,707,252	...	38	...	374	97,559	331	1,491	47	11,200	337	122,186	44	11,001	

6. There are now 355 circles under supplementary survey in Lower Burma, but owing to in some cases thugyis having charge of more than one circle, there are in all only 331 thugyis. Of these, 184 have qualified in surveying and 159 thugyis are reported to have actually taken part in the supplementary survey. By taking part in supplementary survey is meant taking an actual part in the preparation of both map and registers, not merely assisting in writing up the registers. In Pegu thugyis who were qualified in surveying were made to survey some kwins themselves and surveyed a total number of 153 kwins, and this is said to have helped materially in getting the revenue-rolls completed punctually. All thugyis in Pegu assisted in writing up the registers.

The Hanthawaddy thugyis, both certificated and uncertificated, took more interest in their work during the past field season, and the Superintendent ascribes this to the recent proposals for the abolition of the circle thugyis and the substitution of ywathugyis.

In some other districts these proposals are said to have had exactly the contrary effect.

The Deputy Commissioner, Hanthawaddy, in his remarks on the Superintendent's report, says:—

"I wish to note in this place that my Superintendent issued notices to the thugyis that they were to take up a certain number of kwins for supplementary survey, and that the thugyisayès were to take up other kwins, and that the thugyi was not to interfere with the work done by the thugyisayè. This is contrary to the principle on which I have always administered, namely, by holding the thugyi solely responsible, but, as I understood that the order was issued with the knowledge or approval of Mr. Wilson, the Director of Land Records, I did not take any steps to interfere with it."

With reference to this statement it is necessary to remark that either the Deputy Commissioner or his Superintendent has made a very curious mistake. What I did approve was that the qualified thugyis should do the work of some kwins themselves and that the thugyisayès should have nothing to do with these kwins. In paragraph 6 of last year's report, the responsibility of the thugyis for the thugyisayès' work was insisted upon, and this responsibility was still further emphasised by Circular No. 5 issued during the year, in which it was pointed out that in some districts, when a thugyisayè was fined, no corresponding deduction was made from the thugyi's commission, and that thereby the latter actually gained by the *lâches* of his assistant. In the circular referred to, it was stated that as the thugyi was responsible for the thugyisayè's work, he should as a rule be fined as well as the thugyisayè. In Tharrawaddy thugyis surveyed themselves 75 kwins, but the Superintendent reports that the work done by them was not good. In Prome one thugyi worked without an assistant, and seven others also surveyed some kwins themselves and are reported to have worked well. There are a large number of unqualified thugyis in this district. In Bassein 15 thugyis undertook the survey of some kwins themselves, and the work was generally well done. All thugyis, whether qualified or unqualified, were made to visit their thugyisayès periodically, but when the revenue-rolls were completed, the thugyis ceased to interest themselves in the work, with the result that the map correction and survey of interior details of holdings suffered. On the whole, however, the Bassein thugyis took more interest in the supplementary survey work than hitherto, which is due to the hard work and perseverance of the Superintendent, Mr. Beechey. Only nine of the Thôngwa thugyis have qualified in surveying, and of these only four actually took part in supplementary survey. The other thugyis are said to have rendered little or no assistance to their thugyisayès, and would not even take the trouble to see that permanent marks were protected by mounds as ordered. This year was the first year of supplementary survey in 14 out of the 19 circles, and matters will no doubt improve.

In Henzada seven thugyis managed their circles without thugyisayès, and their work was satisfactory, and 26 shared the work with their assistants. In Henzada the kwins in a circle were divided between the thugyi and the thugyisayè, but the former was required to supervise the latter. Many of them are said to be very lax in this supervision. Very few of the Akyab thugyis are qualified in surveying. Seven thugyis managed their own circles and the rest employed thugyisayès,

Besides the seven who did not employ thugyisayès only four did any actual survey work themselves, though several others accompanied their assistants in the field.

The thugyis on the whole have taken a somewhat more active part in the supplementary survey work, but there is still much room for improvement. The thugyisayès generally worked well, and will always work well when properly supervised by the thugyis and Inspectors.

The revenue-rolls were submitted punctually in all districts this year, and considering the largely increased areas under supplementary survey in many districts, and the fact that maps and registers were in some cases unavoidably received late from the Lower Burma Local Survey Office, this is very creditable to all concerned.

Conduct of the Inspectors.

7. The following statement compares the amount of inspection done by Inspectors during the present and preceding years:—

District.	Year.	Number of kwins in tract under supplementary survey.	Work done by Inspectors.		
			Number of Inspectors.	Number of kwins checked.	Average.
Pegu	1890-91	917	4	375	94
	1891-92	924	4	428	107
Hanthawaddy	1890-91	1,003	4	459	115
	1891-92	1,305	4	550	137
Tharrawaddy	1890-91	449	4	206	51
	1891-92	566	4	318	79
Prome	1890-91	465	3	245	82
	1891-92	772	4	292	73
Bassein	1890-91	1,202	7	543	78
	1891-92	1,388	8	809	101
Henzada	1890-91	626	5	322	64
	1891-92	835	5	382	76
Akyab	1890-91	1,010	5	476	95
	1891-92	1,010	5	459	92
Thôngwa	1890-91	...	...	...	...
	1891-92	521	4	211	53

The average number of kwins checked by Inspectors again shows an increase in all districts except Prome and Akyab; the latter district has practically remained stationary; the amount of checking in Prome is inadequate. The checking done during the year has, it is believed, been more thorough and more systematic, those kwins being checked first which had remained unchecked for the longest time. With each monthly progress report maps were submitted showing the kwins checked by Superintendents and Inspectors.

The Inspectors were held strictly responsible for the correctness of all holdings checked by them, and this rendered their inspections more careful and effective. In Pegu Inspectors Maung U and Maung San U worked consistently well. Maung Po Aung takes great interest in his work, and worked well on the whole. Maung Tha Gyaw did not work well and was fined. All the kwins in Pegu except 70 have been examined once during the past three years.

The Hanthawaddy Inspectors worked well. During the year all the area statements from the first year of supplementary survey, with the exception of a few circles, were examined and revised, and the supervision of this tedious work was of course in the hands of the Inspectors. Maung Po So, the Senior Inspector, officiated for Mr. Ford, the Superintendent, on two occasions.

The Tharrawaddy Inspectors worked well, particularly Maung Pan and Maung Po Min. Maung Po Maung is said to have his township in good order. Maung San Nyun, who was badly reported on last year, is said to have improved and to be doing his best; subsequent reports, however, hardly bear this out.

All the Prome Inspectors are said in the report to have worked hard and well, but, as before remarked, the number of kwins inspected by them is inadequate. The improvement noticed in the work of the Bassein Inspectors was continued during the year, and more than the number of kwins required by

the directions were checked during the year. Inspector Maung San E worked badly and his inspections and reports were unreliable. Maung Martin's work, too, was indifferent. The work of Maung Hpo Kye and Maung Louis was very good.

The four Inspectors in Thôngwa were new and inexperienced and had to be taught their work. Maung Aung Ba, one of the newly appointed men, was dismissed and Maung Kyaw Zan has not worked well and seems to be afraid of his subordinates. Maung Thet is highly commended by the Superintendent. The Deputy Commissioner, Henzada, and the Superintendent, Land Records, both say that the existing staff of Inspectors is too small for the work and that another Inspector is required; but the average number of kwins in charge of each Inspector and the average area of the tract under each Inspector is less than in the adjoining district of Bassein, where the work on the whole is of a more difficult character. Maung Po Byu, the Senior Inspector, is a very good man, and during the year was appointed Assistant Settlement Officer and transferred to the charge of the settlement operations in Tavoy and Mergui. Inspectors Maung Aung and Maung Shwe Nu are both said to have worked badly, the former being lazy and the latter unreliable. They will shortly be removed unless their work shows an improvement. Inspector Maung Maung knows his work thoroughly and has worked well. All the Inspectors in Akyab are said to have worked well.

Attached to this report are maps showing for each district under supplementary survey the kwins checked by Inspectors during each of the last three years. To avoid the multiplication of maps the kwins inspected by Superintendents and District Officials have not been shown.

Superintendents.

8. The number of kwins inspected by Superintendents is shown in Statement D of the Appendices. All Superintendents have checked a larger number of kwins than in the previous year with the exception of the Superintendent of Thôngwa (Mr. Munro). Mr. Munro was only appointed to Thôngwa after the field season had begun, and he was ill during the greater part of December. His work, too, in training both Inspectors and thugyisayès was very heavy. The amount of inspection done by Messrs. Beechey and Ford and Maung Shwe Gyôk and Maung Ba Ôn is creditable, as is also Mr. Palmer's work when it is considered that he was newly appointed during the year and only took charge on the 1st December. Mr. Torrens (Pegu) was employed about one month of the field season in inspecting and supervising the survey of pottas in the Kamase circle, which was thrown open for cultivation during the year. Part of the time of Maung Tha Do Pru (Akyab) was taken up in inspecting work in the unsettled circles of his district, but I think he might have inspected more kwins in the tract under supplementary survey. All the Superintendents have worked well, but I would specially mention Messrs. Beechey, Palmer, and Ford. I was unable to visit the Akyab district, but the Deputy Commissioner remarks:—

"The Superintendent, Maung Tha Do Pru, worked well and has been of great assistance to me."

The Deputy Commissioner, Henzada, remarks regarding Maung Ba Ôn, who was appointed during the year:—

"He has now visited every circle and has become acquainted with the thugyis and the district as well, and has given me much satisfaction in the discharge of his duties coming after so good a man as his predecessor."

Inspection of supplementary survey by Deputy Commissioners, Subdivisional Officers, and Township Officers.

9. The Deputy Commissioners of Hanthawaddy, Pegu, Prome, and Henzada all checked the work in a considerable number of kwins, but little checking was done by the Deputy Commissioners of Bassein and Akyab and none by the Deputy Commissioner of Thôngwa, who was prevented by a sprained ankle from doing any field work. The amount of checking by Subdivisional and Township Officers shows a considerable improvement over the previous year, and Pegu, Hanthawaddy, and Henzada show best in this respect. The amount of checking done by Township Officers in Tharrawaddy, Prome, Bassein, Akyab, and Thôngwa was quite inadequate.

The Commissioner, Arakan Division, remarks:—

"The Myoôks have not done sufficient checking in the Pauktaw, Minbya, Rathedaung and Myohaung townships. For many of these officers there is no excuse."

Inspections by the Director.

10. During the year I checked the field work in all districts under supplementary survey except Akyab. Owing to my proceeding on privilege leave in April I was unable to visit Akyab. The list given below shows the number of circles inspected in each district:—

	Number of circles inspected.
Pegu	11
Hanthawaddy	9
Tharrawaddy	16
Prome	12
Bassein	8
Henzada	9
Thôngwa	5

In Hanthawaddy the work in the kwins tested was on the whole good, and Mr. Ford evidently looks after his men closely. The work in Pegu was not so good as I expected it to be. Mr. Torrens, I think, does his utmost to ensure correct work, but does not exact enough from his Inspectors. The field work in three of the four Inspectors' circles in Tharrawaddy was good, but in Maung San Nyun's circle it was bad. As noted above, this man is said to have improved during the season. My visit took place at the beginning of the season. The work in Prome on the whole was not satisfactory, several bad mistakes being discovered, although the work in the kwins inspected was of an easy description. The Superintendent, Maung Shwe Gyôk, is not, I think, sufficiently strict with his subordinates. In Bassein the field work in the kwins inspected was, as a rule, good, but the work of Inspector Maung San E was bad. The work in Bassein is difficult, but Mr. Beechey, by looking closely after his Inspectors, is getting the district into very good order. On the whole the work in Henzada, as far as I examined it, was very fair. The kwins tested were not, as a rule, very difficult, but there was plenty of scope for making mistakes, and the result was creditable.

The kwins inspected in Thôngwa were nearly all easy, and the work was fairly correct. In the one really difficult kwin examined the work was distinctly bad, and the Superintendent informed me that he had met with even worse work. As before mentioned, Inspectors and taiksayès in this district were new, and it will take some time to get them in order; but Mr. Munro is energetic and will no doubt succeed.

I inspected the record-rooms and offices at the headquarters of all the districts visited except Hanthawaddy. The record-rooms are all in good order with the exception of Thôngwa. The state of the record-room at Bassein reflects great credit on Mr. Beechey, as, when I visited it last year, it was in very bad order. Thôngwa could scarcely be said to have a record-room at the time of my visit; the records and maps were placed in a room at the basement of the Court-house with an earthen floor and bamboo mat walls. The survey maps were in the boxes in which they had been received from Calcutta, and the settlement registers were not in racks, but were arranged as well as possible under the circumstances. The room was quite unsuitable for the purpose, and during the present rains, to preserve the records, they have been removed to a new house which has been rented for the purpose. A new fire-proof record-room is being built at Ma-ubin, and as soon as this is ready, the supplementary survey records will be placed in it, and accommodation can then be found for the Superintendent's office in the District Court-house.

A new record-room is also required at Tharrawaddy and one is to be built shortly.

Records in the possession of thugyis.

11. Thugyis are being induced gradually to set apart a separate room in their houses for the purpose of an office and for the custody of the maps and records, and considerable progress has been made in this matter in most districts. Henzada shows best in this respect. The Superintendent of Bassein experienced considerable difficulty at first, but has now succeeded in getting separate rooms set apart in most cases, and in some cases thugyis have built new and substantial offices. The offices in Akyab are not so good as in other districts, as the thugyis' houses are themselves inferior structures. The Thôngwa thugyis have done nothing towards setting

apart a room in their present houses or building new offices, but they have hardly had time as yet, and as they generally have good houses, there should not be much difficulty in the matter.

Permanent survey marks.

Director of Land Records and Agriculture's Circular No. 17 of 1889.

Director of Land Records and Agriculture's Circular No. 5 of 1891.

12. The rules regarding the inspection and preservation of permanent survey marks are contained in the circulars noted in the margin. These circulars are attached to this report as Appendices. The circulars apply to all permanent survey marks, whether on the boundary or in the interior of kwins.

During the year the requirements of Circular No. 17 of 1889 were complied with in all districts.

The figures given in Statement **G** of the Appendices relate to the period ending 31st March 1892, but field-work in most districts continued throughout April. The figures for all districts except Prome show that more than one-third of the marks had been visited by the end of March, and in the case of Prome the fact that during the year 8,060 marks were protected as prescribed in Circular 5 of 1891 shows that the prescribed amount of inspection was done in that district also. The statement given below shows the number of survey marks protected as prescribed in Circular 5 of 1891 in each district under supplementary survey.

Pegu	8,171
Hanthawaddy	8,838
Tharrawaddy	7,439
Prome	8,060
Bassein	18,209
Henzada	19,316
Thôngwa	6,986
Akyab	8,382

In some districts in addition to a mound being built over the permanent mark a fence has been placed round the mound, as it has been found that there is danger of the mounds being damaged or destroyed by the village cattle.

Before mounds were built it was often extremely difficult to find the marks, owing to the fact that in many cases, in low-lying lands, they became covered during the rains with a layer of mud of considerable thickness which, afterwards solidifying, completely hid the mark from view. The marks as originally laid down by the Survey Department only projected a few inches above the ground, and in the ploughing season were quite invisible and were frequently destroyed by cultivators accidentally. The building of the mounds will obviate this in future and will render the inspection of the marks an easy matter.

The districts in Upper Burma which have been either wholly or partially surveyed and in which permanent marks have been put down are Kyauksè, Mandalay, Meiktila, Yamèthin, Sagaing, Shwebo, Minbu, and Magwe. Circular 5 of 1891 was circulated to all District Officers in Upper Burma and the statement given below shows the progress which has been made in the protection of the marks.

	Total number of marks in district.	Number of marks protected.
Kyauksè	8,502 ...	4,436
Meiktila	4,499 ...	4,326
Yamèthin	Not known ...	Not known.
Mandalay	6,703 ...	2,585
Sagaing	Not known ...	Not known.
Shwebo	863 ...	863
Minbu	24,595 ...	Nearly all.
Magwe	Not known ...	None.

There is no Supplementary Survey staff in Upper Burma except in a very small area in Mandalay, so that the work has to be left to the village headmen.

Tracts which it will be necessary to re-survey at the end of the term of settlement.

13. This subject has been noticed in the district reports, in all of which areas are returned as requiring re-survey at the end of the term of settlement, but from the result of my inspections during the past year I am still of opinion that at the end of the term of settlement there will only be very small areas requiring re-survey in any district, and in no case should it be necessary to employ any special staff for the work. In Tharrawaddy, which was one of the districts in

which (owing apparently to the original survey having been made before the cultivation had become permanent), the field boundaries had been most changed, 24,037 fields with an area of 9,171 acres were surveyed during the year. In Pegu too an area of 14,297 acres was re-surveyed field-by-field and the maps are to be reprinted at the Government Press for use next year. After Tharrawaddy, Bassein, owing to the large extensions in kwins which were largely uncultivated at the time of survey, is the most difficult district: here an area of 3,002 acres was surveyed field-by-field. A very much larger area would have been done if the field-work had not been closed on the 1st April instead of being continued till the end of April, as in most districts. The cause of this was as follows: in March a letter was issued by the Financial Commissioner calling for the early submission of the revenue report which was to be submitted by the 1st June instead of the 15th July as usual. The statistics for the revenue report in districts under supplementary survey are compiled by the Superintendent of Land Records and his Inspectors and staff, so on the receipt of the letter referred to above, orders were issued in all districts for field-work to be closed from the 1st April. This matter was brought to my knowledge when on tour, and when it was represented to the Financial Commissioner that the interpretation put upon his orders by the District authorities would result in the loss of the last month (April) of field-work, another letter was issued saying that on no account was field-work to be stopped before the end of April. This letter had the desired effect in all districts, except Bassein, where the letter to the Superintendent, Land Records, was kept by the Deputy Commissioner through whom it was sent, for some days, by which time it could not be acted upon and thus a month's field-work was lost in Bassein. The Deputy Commissioner explained that he was ill at the time and the importance of the letter was not realized by him; but to obviate similar occurrences in future the Commissioner, Irrawaddy Division, suggests that letters to the Superintendent, Land Records, dealing with supplementary survey, should be passed on to him by the Deputy Commissioner the same day in the same way as communications to the Treasury Officer from the Comptroller are at present. This is, I think, the usual procedure in urgent matters, and the delay referred to above is much to be regretted. The Superintendent, however, is confident that by the end of next field season he will be able to report that there are no areas requiring re-survey at the end of the term of settlement. He intends to run plane-table or theodolite subtraverses through the kwins which were waste at settlement, but are now cultivated, and in this way the re-survey will be simplified, and I think the expectation noted above will be nearly if not quite realized.

Supplementary Survey, Mandalay.

14. The same area was under supplementary survey in Mandalay as was reported last year. The work was carried on by six surveyors and was under the general superintendence of Mr. Gibson. The Inspector Maung Byaung who was in charge last year was promoted to a Myoôkship and attached to the Upper Burma Special Survey Party. He, however, continued to look after the supplementary survey work and inspected 76 out of the 79 kwins in which work was in progress. The area returned by the thugyis as actually cropped was 12,757 acres, while the area found by supplementary survey was 20,654 acres excluding bobabaing unirrigated land. The reason for this large difference is partly that many fields which were sown and which at the time of the Supplementary Surveyors' visit contained small healthy plants, afterwards, owing to drought, withered and came to nothing and therefore were not assessed by the thugyis. The assessment by the thugyis amounted to Rs. 37,733 in the year under report against Rs. 31,265 in the previous year: the increase was due partly to an area of 2,000 acres being transferred from the Sagaing district to Mandalay. No revenue rates have as yet been sanctioned for the tract under supplementary survey, and assessments are consequently not based on the areas found by supplementary survey; a copy of the rolls as prepared by the Supplementary Surveyor is made over to the thugyis for purposes of comparison and check, but it does not appear that much use is made of it. There were in all 1,120 permanent survey marks in the tract. Of these 393 are missing and 32 have been replaced. Of the 727 marks found 419 were protected by mounds as directed in Circular 5 of 1891. The majority of the missing marks

were in the low-lying lands subject to the annual floods of the Irrawaddy. The missing marks will be replaced by Mr. Gibson by means of the theodolite.

Thugyis' records in unsettled circles.

15. As year by year larger areas are brought under supplementary survey the checking of thugyis' areas in unsettled circles becomes of less importance, and in any case as noted in last year's report the checking in the absence of maps is of little value. The statement given below shows the amount of checking in unsettled circles done by the Supplementary Survey staff in each district.

	Number of unsettled circles tested.	Number of kwins tested.	Number of holdings tested.
Akyab	9	...	118
Prome	10	...	42
Pegu	2	...	9
Tharrawaddy	6	16	...
Bassein, Hanthawaddy	No unsettled circles.		
Thôngwa	No testing done.		

SURVEY.

Cadastral survey by Local Agency.

16. During the field-season of 1890-91 an area of 1,441 square miles was surveyed cadastrally by the Local Agency Party under Mr. Clancey. During the recess season, June—December 1891, the whole of the map and office work relating to this area with the exception of the 2-inch reductions was completed. The recess work consisted of the inking-in of maps, numbering of fields, and the calculation of areas: the 16-inch sheets had also to be typed. When this work was completed maps had to be prepared for lithography at the Government Press.

In addition area statements were prepared in duplicate and the first year's maps and registers were prepared for the use of the supplementary survey. The greater portion of these maps was made over to Deputy Commissioners by December 1st and the balance by December 11th. These maps and registers were used for supplementary survey in all the five districts to which they referred, namely, Hanthawaddy, Henzada, Tharrawaddy, Prome, and Bassein.

The work in the Map Section owing to the large area surveyed and to the recess season being curtailed by half a month (the previous field season having been prolonged by that period) was exceedingly heavy, and notwithstanding that extra hands were engaged, the work could not be completed in time to allow of the 2-inch reductions being taken in hand till after the recess season, and the work of preparing the 2-inch sheets, of which there were 84, was not completed till June 1892. The rates charged by the Superintendent, Government Printing, are, for the 16-inch sheets Rs. 7 and for the 2-inch sheets Rs. 11. The cost of the preparation of the maps in the Local Survey Office is Rs. 4-3-0 and Rs. 6-10-0 respectively, so that the total cost of the 16-inch sheet is Rs. 11-3-0 and of the 2-inch sheet Rs. 17-10-0. The corresponding figures last year were Rs. 14-8-0 and Rs. 21-12-0, so that a satisfactory reduction in cost has been effected, although last year's rates were themselves very low.

Traverse work undertaken by the Local Agency Party.

17. At the end of last field season there were in hand traverse plots of 367·41 square miles in Prome which had been prepared by No. 12 Party of the Survey of India. There were also traverse data for 131 square miles in Thôngwa which had been surveyed by No. 7 Party of the Survey of India. No. 12 Party was under orders for transfer to the Minbu district in Upper Burma, while No. 7 Party was engaged in the cadastral survey of the Amherst district, on the completion of which it was to take up Shwegyin and Toungoo. No other Survey of India Party was available for work in Lower Burma, so it became necessary to consider how the survey of the tracts still remaining for survey was to be effected. These tracts were situated in the Thayetmyo, Thôngwa, Bassein, Kyaukpyu, and Sandoway districts, and their total area was estimated at about 3,000 square miles. As no other agency was available it was decided that the traverse survey should be undertaken by the Local Agency Party, and as there was no provision in the budget of 1891-92 for the estimated cost, Rs. 56,608, of the traverse opera-

tions, the Government of India was asked to make a special grant for this purpose. This request was acceded to and it was further stated that two-thirds of the cost would be an Imperial charge, the remaining one-third being debited to Provincial revenues.

Organization of Traverse work.

18. It was decided to have two traverse camps, each in charge of an European officer. One of these officers, Mr. Hardinge, was already available, being in charge of the Map Section of the office, another, Mr. Haddock, was obtained from the Survey of India Department, he being seconded for service with the local Government in the same way as Messrs. Torrens and Beechey had been previously for the Supplementary Survey staff. During the recess season arrangements for the engagement of the large number of additional surveyors and menials and for obtaining the necessary supplies of mathematical instruments, furniture, stationery, forms, &c., were carried out by Mr. Clancey. As the surveyors engaged were as a general rule ignorant of theodolite work regular classes were formed during the recess and the men were instructed by Messrs. Clancey and Hardinge and, on his joining the staff at the end of October, by Mr. Haddock. The Burmans who were to be Assistant Camp Officers, and those students who showed a special aptitude for the work, were also instructed in the methods of observing stars and the sun for azimuth, time, &c., and in the corresponding methods of computation. All arrangements necessary to enable the Traverse parties to take the field at the beginning of December were made and everything was successful except for a *contretemps* which occurred in India and which resulted in the loss of Rs. 2,700 of Government money and caused much trouble and anxiety. It had been arranged that the supply of khalassis for the traverse work, some 380 men, should be obtained from India in the same way as is done for Survey of India parties working in Burma. Mr. Clancey employed as his agent for recruiting the coolies, a Mr. Johnson of Hazaribagh who was in the habit of engaging coolies for Survey of India parties. The coolies were duly engaged by Mr. Johnson, advanced certain sums and despatched to Calcutta. Mr. Clancey had sent to take charge of them a native jemadar (pay Rs. 18 a month) notwithstanding that Mr. Johnson had laid stress on the fact that an European should be sent to meet the men in Calcutta. From some cause or other the men became dissatisfied or frightened in Calcutta and refused to proceed to Rangoon. They returned to Hazaribagh with the advances they had received and it was impossible to recover anything from them. The local Government to whom the matter was referred considered that Mr. Clancey was deserving of censure and had acted with great want of judgment, but in consideration of his uniformly good services agreed to ask the Government of India for permission to write off the amount of money advanced to the coolies as irrecoverable.

Field operations and results.

19. Two traverse camps were formed and despatched to their destinations,—Camp No. 3 to Thayetmyo and Camp No. 4 to Thôngwa,—in the beginning of November. The former remained in Thayetmyo the whole field season, while the latter after completing its work in Thôngwa was transferred to Bassein. Camp No. 3 kept the Cadastral Camp supplied with plots all the year, but Camp No. 4 was caught up by the Cadastral Camp which had to survey a small area on the triangulation system. Camp No. 3 under Mr. Hardinge supplied 752 sheets relating to 295 kwins during the year, and Camp No. 4 supplied 995 sheets belonging to 400 kwins, in addition to plotting 205 sheets from data given by No. 7 Party of the Survey of India. The statement given below shows the area traversed in each district.

District.	Total area surveyed during the year.	Surveyed area of which kwin plots were prepared.
	Sq. miles.	Sq. miles.
Thayetmyo	747·24	537·00
Prome	8·92	8·92
Thôngwa	136·05	136·05
Bassein	695·23	595·23
Total ...	1,587·44	1,277·20

Jungle kwins in Thayetmyo and Bassein with an aggregate area of 210·24 and 100 square miles respectively were not set up and plotted.

The total number of stations at which the theodolite was set up amounted to 17,416 and the number of angles observed to 18,936. The angular work was checked by star and sun observations for azimuth at 88 stations and the linear work by connection with 13 Great Trigonometrical stations. The entire cost of the traverse work, exclusive of that in connection with pipe-embedding and the preparation and service of notices to village headmen, amounts to Rs. 74,073, made up of the actual expenditure of the seven months of the field season and the full sanctioned allotment for the five months of the current recess. The cost rate per square mile is thus Rs. 46, a very low figure when it is considered that the nature of the country operated in was very difficult, in Thayetmyo being intersected by heavily wooded hills and in Bassein and Thôngwa by numerous creeks. To show the nature of the country worked over it is only necessary to mention that 1,827 miles of line-cutting through jungle had to be done. The heavy initial outlay in the purchase of instruments, &c., also materially added to the cost, as did also the monthly charges for boat-hire for surveyors and their squads in the Bassein and Thôngwa districts. The demarcation work in Thayetmyo was very badly done and had practically to be entirely revised by Mr. Hardinge and his staff.

Messrs. Haddock and Hardinge deserve great credit for their excellent work in the face of numerous and serious difficulties.

The Assistant Camp Officers Maung San Dun, Maung Shwe Ô, and Maung Tha Byaw also worked well.

Field work of the Cadastral section of the Local Agency Party.

20. Two cadastral camps of a total strength equal to that of the camps working last year were formed, one under Maung Pyu Than, to work in the Prome and Thayetmyo districts, and the other under Maung Tun, for work in the Thôngwa and Bassein districts. The camps took the field at the beginning of December. At the beginning of the year the Prome camp had in hand traverse plots of 367·41 square miles in Prome and on the completion of this area it was kept fully supplied with plots by the Local Traverse Camp working in Thayetmyo. The second camp, however, on the completion of the work in the Thôngwa district overtook the other Local Traverse Camp and had to survey an area of 91·13 square miles on the triangulation system, the points afterwards being picked up by the Traverse Surveyors, as described in paragraph 8 of Mr. Clancey's report, extracts from which are appended to this report.

The statement given below shows the area cadastrally surveyed in each district with the proportion of cultivated area to waste :—

	Square miles.	Cultivation.	Waste.
Prome	367·41	1	15·24
Thayetmyo	323·27	1	3·01
Thôngwa	267·91	1	1·99
Bassein	598·09	1	5·80
Thayetmyo	8·92	...	...
Total ...	1,565·60	1	4·5

Thus an area of 1,565·60 square miles was surveyed cadastrally against 1,440·53 square miles in the year before. The proportion of cultivation to waste is not excessive except in Prome, where the figures show that the country was hardly worth surveying on the 16-inch scale. The tract had, however, been traversed by No. 12 Party of the Survey of India in the previous year and it was necessary to make use of the plots supplied. The tract too is said to contain large areas of "indaing" land fit for cultivation and likely to be taken up. The total cost of the work, exclusive of that of holding-marking, preparation of maps and registers for supplementary survey, and the preparation of the 16-inch and 2-inch maps for lithography, is Rs. 91,078-15-2. This includes the actual expenditure during the field season together with the sanctioned estimates for the current recess season. The cost rate per square mile is therefore Rs. 58 as against Rs. 67 last year. The proportion of cultivation to waste which over the whole tract is about 1 : 4·5 has undoubtedly something to do with the lowness of the cost rate,

although it is not actually known what is the actual relative cost of surveying fields and topographical features. But on the other side of the question the disadvantages under which the Local Agency Party works owing to the work being situated in different districts and the consequent loss of time and increased expense due to the camps having to be transferred from one centre to another, the difficult nature of the country worked over, and the small size of the average field, all tend to enhance the cost of the work, so that the extremely low cost rate at which the work of the present year has been carried out is very creditable to Mr. Clancey and the officers working under him.

Myoôks and Inspectors.

21. The Camp Officers originally posted to the Cadastral Section were Myoôks Maung Tun and Maung Pyu Than. The former remained in charge of his camp throughout the year and worked well; the latter did not give satisfaction and was transferred to the office, losing his charge allowance of Rs. 50. Maung San Dun from the Traverse Section succeeded him and did good work. The Inspectors as a rule did not work well at first, but were finally brought into trim by severe punishments.

Holding-marking.

22. The whole of the holding-marking for the area cadastrally surveyed was completed during the year; 39,302 holdings with a total area of 178,164 acres were marked. Approximately one-sixth of the holdings were inspected by the Inspectors, and the work generally was good.

The cost of the holding-marking was Rs. 3,915-7-11. This is in excess of last year's cost, and the excess is due to each holding-marker being allowed two chainmen for the purpose of any revision survey which he might find necessary at the time of the holding-marking.

Increase in area and revenue due to the year's operations.

23. Mr. Clancey in his report contrasts the figures for area and revenue as obtained by survey with the thugyis' figures for 1890-91 except in the case of Prome and Bassein, for the former of which he takes the thugyis' figures of 1891-92 and for the latter thugyis' figures of 1889-90. The reasons for this are those given in paragraph 20 of last year's report. In this way he arrives at an increase in area due to survey of 76,877 acres and in revenue of Rs. 1,28,733. I, however, although admitting the force of Mr. Clancey's remarks in paragraph 25 of his report, think it is better to contrast the figures obtained by survey with the thugyis' figures for the year of survey, *i.e.*, 1891-92.

This comparison is given below:—

District.	Areas according to survey of revenue-paying lands.	Thugyis' areas in 1891-92 for the same lands.	Revenue on area as found by survey.	Revenue on the area as given by thugyis.
	Acres.	Acres.	Rs.	Rs.
Prome	14,318·88	12,692	8,538	7,063
Thayetmyo	52,816·85	33,154	62,528	37,165
Thôngwa	57,097·56	36,537	1,22,246	78,335
Bassein	53,931·67	30,185	87,464	48,136
Total ...	178,164·96	112,568	2,80,776	1,70,699

The above shows that the survey operations of the year resulted in an increase of 65,596·96 acres in revenue-paying area with a corresponding increase of revenue of Rs. 1,10,077.

Correctness of the work.

24. I visited the camps in the Bassein and Thôngwa districts and checked both the survey and holding-marking work and found it to be of good quality. During the course of my inspection of supplementary survey in the Hanthawaddy district, I inspected kwins which had been surveyed by the Local Agency Party and found that the work was very good.

The maps and records have been used for supplementary survey in Bassein, Henzada, Prome, Tharrawaddy, and Hanthawaddy with satisfactory results, and

as a general rule the work of the Local Agency Party has been found to be correct. Complaints were, however, received from the Hanthawaddy, Tharrawaddy, and Prome districts during the year reporting that some of the work done last year was incorrect. The work was said to be incorrect in three kwins in Prome, seven in Hanthawaddy, and two in Tharrawaddy, the total number of kwins surveyed by the Local Agency Party in these districts being 425,309, and 116 respectively. Enquiries were made with the following results:—

In Prome in one case the original survey was found to be correct.

In another case the boundaries of several "kaing" (miscellaneous) holdings consisting of sandy soil near the edge of a river were found to disagree with the map. These holdings are frequently changed, but whether in this case the changes had been made subsequent to survey it is impossible to say.

In the third case several gardens and "taungyas" had been omitted; the latter are always omitted, but the omission of the former was a mistake. The surveyor laid the blame on the thugyi, who, he said, prevented him from surveying the gardens on the ground that they had been abandoned and did not pay revenue. This explanation is probably, I think, untrue.

In Hanthawaddy the maps were found to be defective, but not to a serious extent. In some cases this was ascribed to the survey being of inferior quality, and in others to the kazins being changed owing to the kwins being low-lying and subject to floods. There is, however, I think, no doubt that actual inaccuracies of survey were found in this district in the kwins mentioned.

In Tharrawaddy one of the kwins in which the work was said to be inaccurate had been partalled by myself in the previous year, with good results. Errors were found owing to kazin changes in holdings where the kazins at the time of survey had been shown as temporary and marked with dotted lines, but in the lithographed copy of the map these kazins had been shown with firm lines by mistake. In the second kwin the survey was inaccurate.

The utilization of the maps for supplementary survey the year after survey subjects the work both of holding-marking and survey to a very severe test and it must be said that the maps have stood the test very well.

The accuracy of the mathematical results of the traverses made by the Local Agency Party is shown in Statement **D** appended to Mr. Clancey's report, and the accuracy of the maps and registers prepared this year solely by Local Agency will be thoroughly tested when the whole area comes under supplementary survey next field season.

In conclusion I think it will be admitted that notwithstanding the coolie *contretemps* referred to above Mr. Clancey has been conspicuously successful in carrying out a very onerous and important piece of work and deserves the greatest credit for his exertions.

Copious extracts from Mr. Clancey's report, together with maps and statements, are appended to this report.

Special potta survey, Pegu district.

25. Kwin No. 57 of the Kamase circle of the Pegu district was formerly reserved as a grazing-ground; its area as ascertained at the time of the cadastral survey of the district being 8,791 acres. The present area, however, is much in excess of this owing to the Sittang river, on whose banks the kwin is, having receded several miles from its old position. During the year under report the kwin was thrown open for cultivation and an area of 19,000 acres was surveyed and demarcated into 25-acre blocks. Up to the close of the year 16,000 acres had been allotted to cultivators and the entire cost of the survey and demarcation has been recovered from the grantees, so that the cost to Government has been nil.

Surveys by Local Agency in Upper Burma.

26. All the surveys in Upper Burma other than those conducted by the Survey of India Department are in charge of Mr. Gibson, Extra Assistant Commissioner.

Mr. Gibson during the year was in charge of the following surveys:—

(*a*) Supplementary survey Kutywa, Taungbyôn circles, Mandalay district.

(*b*) Supplementary survey, Mandalay town.

(*c*) Topographical survey, Yenangyat oil-field.

(*d*) Cadastral survey of the Twingôn and Bèmè oil-field reserves.
(*e*) Cadastral survey of Royal and irrigated lands in the Shwebo and Yamèthin districts.

(*a*) has been dealt with already, (*b*) is under the control of the Deputy Commissioner, Mandalay, and is paid for by the Municipality; (*c*) and (*d*) are under the direct control of the Financial Commissioner and are dealt with in the Revenue report.

The cadastral survey in Shwebo and Yamèthin was a continuation of the work described in paragraph 25 of last year's report.

The following statement shows the area for which the detail survey was completed in these two districts up to 31st March 1892. After that date the two parties were amalgamated and transferred to Meiktila.

	Area in acres.			Area in square miles.
	Cultivated.	Uncultivated.	Total.	
Shwebo	38,031·00	3,185·00	41,216·00	64·40
Yamèthin	29,741·77	9,008·87	38,750·64	60·55
Total ...	67,772·77	12,193·87	79,966·64	124·95

This survey was based on a theodolite traverse executed under the superintendence of Mr. Gibson. The average size of the fields surveyed was ·56 acre in Shwebo and ·63 acre in Yamèthin. The strength of the staff by which the above survey was conducted was two Myoôks, six Inspectors, and 39 surveyors and clerks. In addition to the cadastral survey, holdings were marked over the whole area surveyed, and holding registers prepared. The cost of the survey is as follows:—

	Rs.
(*a*) Shwebo	12,000
(*b*) Yamèthin	9,065

(*a*) includes Rs. 2,866 and (*b*) Rs. 1,000, the estimated cost of mapping, &c., in the recess season. The total cost therefore of traverse and cadastral survey, holding-marking and preparation of registers, and of the preparation of the maps for lithography is Rs. 169 per square mile over the whole area surveyed. Considering the smallness of the area worked over, the small size of the fields and the fact that practically the whole area is cultivated, this is a very satisfactory result. The statement given below compares the areas as found by survey and as given by the thugyis for the circles which have been completely surveyed. The areas are returned by the local officials by circles so that this is the only comparison that can be made.

	Area under assessment		Increase in area.	
	As shown by local officials.	As found by survey.	Acres.	Percentage.
	Acres.	Acres.		
Shwebo	13,003	38,031	25,028	192·5
Yamèthin	18,242	33,679	15,437	84·6
Total ...	31,245	71,710	40,465	129·2

This comparison, however, is not strictly justifiable as the thugyis would not include in their figures the area of land on which crops had been sown but failed, whereas all cultivated land is included in the survey figures.

It is impossible to give an estimate of the increase in revenue obtained as the revenue rates are not known with accuracy, being based on a share of the pro-

duce. A map showing the progress of surveys in Upper Burma, both those under Mr. Gibson and those under the Survey of India, is appended to this report.

Mr. Gibson continued to discharge his multifarious duties (which, in addition to those mentioned above, included the surveyof the town of Mônywa) with complete satisfaction, and he was during the year promoted from the 5th to the 4th grade of Extra Assistant Commissioners.

Survey by the Survey of India Department.

27. During the year under report there were three cadastral survey parties working in the province,—No. 7 in Lower Burma, No. 12 partly in Lower Burma but chiefly in Upper Burma, and No. 3 entirely in Upper Burma.

No. 7 Party was under Mr. Wood and was working in the Amherst, Tavoy, and Mergui districts. No. 12 Party was under Messrs. Grant and Patterson and worked in the Prome, Minbu, and Magwe districts. No. 3 Party was under Mr. G. B. Scott and worked in the Sagaing and Shwebo districts.

The statement given below shows the area surveyed during the year in each district, together with the cost of the operations :—

		Area traversed.	Area surveyed cadastrally.	Total cost.
		Sq. miles.	Sq. miles.	Rs.
No. 7 Party ...	Amherst	970	550	2,15,000
	Tavoy	380	310	
	Mergui	170	150	
No. 12 Party ...	Prome	112	...	2,24,300
	Minbu	1,225	760	
	Magwe	205	...	
No. 3 Party ...	Sagaing	1,142	1,842	2,52,500
	Shwebo	700	...	

Mr. Wood, Superintendent of No. 7 Party, in addition to his own duties supervised the work of holding-marking in the Tavoy and Mergui districts.

The survey officers in charge of camps have worked with the local authorities with the greatest cordiality during the year, and there has been no friction of any kind.

In addition to the cadastral parties mentioned above there was a Topographical Party, No. 13, working in the Mergui district. This party surveyed 766 square miles on the 1-inch scale at a cost of Rs. 64,000.

Survey schools.

28. No new survey schools were opened during the year. The school at Toungoo, which was supported by the Municipality, was closed on 31st March 1892 owing to want of funds, but it has since been re-opened as a Government school, as surveyors in considerable numbers will be required in Toungoo when the district comes under supplementary survey, which will take place in two or three years.

The recent uncertainty regarding the position of thugyis owing to the proposal for their abolition and the substitution of ywathugyis has had a prejudicial effect upon the attendance at some schools, particularly Hanthawaddy and Pegu. This, however, is probably only temporary.

The examinations in Lower Burma were held by the Educational Syndicate, and those in Upper Burma by Mr. Gibson, Extra Assistant Commissioner, and Mr. Connor, of the Survey of India; the papers in Upper Burma being approved by me before being set. The statement given in the appendix shows the number of pupils from each school successful at the Lower Burma examinations and the list given below those from each school in Upper Burma successful at the examinations held in Mandalay—

Mandalay.	Yamèthin.
Kyauksè.	Sagaing.

Minbu.

Considerable numbers of Burmans who have been trained in the Upper Burma Survey schools are now working in the Local Agency Party under Mr.

Gibson and in No. 3 Party of the Survey of India under Mr. Scott. Upper Burmans seem to take very kindly to survey work and the attendance at all the schools is good. The schools noted on the margin were inspected by me during the year, and I found that there had been an improvement in the points noticed at the previous year's inspection. No suitable building has yet been provided for the Survey school at Ma-ubin, the school at present being held in a small building which was originally intended for the quarters of the chaprassies attached to the District Court. New rooms will probably be available when the new fire-proof record-room is built.

Pegu. | Bassein.
Prome. | Henzada.
Tharrawaddy. | Thôngwa.
Mandalay.

SECTION II.

ANALYSIS OF DISTRICTS WITH REFERENCE TO SECURITY AGAINST FAMINE.

29. During the year an exhaustive analysis has been made of each district with reference to its security against famine and a programme of relief works drawn up sufficient in most cases to provide work for the maximum number of persons who are likely to suffer from famine in the event of serious famine. Lower Burma, with the exception of small areas in Tharrawaddy, Prome, and Thayetmyo, may be said to be secure against famine, while in Upper Burma Kyauksè is the only district which has been declared to be entirely secure. In some districts although all known projects have been entered in the programme of relief works sufficient works have not yet been provided for the maximum number of persons likely to require relief, and until a detailed survey of these districts has been made by Engineers the Deputy Commissioners profess themselves unable to recommend any further works being entered in the programmes. It may be mentioned, however, that the estimated maximum number of persons who may require relief is in all districts very largely in excess of the numbers who worked on relief works during the recent scarcity.

SECTION III.

FODDER RESERVES AND ARBORICULTURE.

30. The paragraph in the Revenue Report on this subject contains all available information as to grazing-grounds. By order of the Chief Commissioner, Commissioners and Deputy Commissioners in Lower Burma were asked if it would be feasible to get umbrageous fruit trees planted in grazing-grounds by the people themselves, they being remunerated by being allowed to take the fruit of the trees planted, a plan which had been successfully adopted in the Central Provinces. The replies from nearly all districts showed that existing grazing-grounds were nearly all sufficiently provided with shade-trees, and all officers were unanimous in reporting that it would not be possible to induce Burmans to plant trees in grazing-grounds without other remuneration than that mentioned above.

SECTION IV.

AGRICULTURAL EXPERIMENTS.

Lashio Experimental Farm.

31. The operations described last year were continued during the year under report. One hundred and sixty-seven acres were under cultivation, of which 40 were sown with wheat. The remaining area was under maize, gram, ragi, hemp, tur, beans, ground-nut, and peas. Of these the only crops which succeeded were maize, ground-nuts, and tur (dhall). The wheat and gram failed completely.

The reasons given by Mr. Hillier for the failure of the wheat are—

(1) Bad seed. | (2) Unsuitable soil.

In last year's report it was pointed out that according to Indian experience wheat should be sown in October or November, and Mr. Hillier was directed to sow in those months, as well as in August and September, which were the months

suggested by him. His report shows, however, that only one sowing was made in October, and that at the beginning of the month, while the quantity of seed sown per acre was quite inadequate. It is possible that the soil of the farm is unsuitable for wheat, but this has not previously been assigned as a cause of failure. I was unable to visit the farm during the year as intended.

The amount of rainfall registered was 48·28 inches excluding the months of November, December, and January, when the Superintendent was on tour and no record was kept. This shows that in this respect the climate of Lashio is quite suitable for wheat. It is unfortunate that no record was kept during the three months above mentioned as the success of the wheat crop often depends upon the December and January rain. The experiment is to be tried again this year, and Mr. Hildebrand, who has succeeded in growing wheat in the Southern Shan States, has been asked to send an account of his methods of cultivation to Mr. Hillier. The main object of the Lashio farm was the introduction of new staples (wheat particularly) into the Shan States. It cannot be said that the farm has as yet proved successful. This year Mr. Hillier is to select and buy his own wheat seed.

Dairy farm.

32. The dairy farm was very successful during the year, 20 calves, the produce of the imported Australian bull, being born, the only death being that of a bull which was bought during the year. The herd at the beginning of April 1891 consisted of 42 animals; 25 were purchased during the year, and the strength on 1st April 1892 was 86, of which 22 heifers and 19 bulls were half-bred Australian.

The considerable sum of Rs. 794-2-6 was realized by the sale of milk.

Sheep farm.

33. The sheep farm was also successful, the strength of the flock being 67 at the end of the year against 53 at the beginning. The cross between the Chinese and Madras sheep has been a success, the issue being quite hardy. Mr. Hillier has been asked to give a fuller account of his arrangements for grazing and shepherding the flock in his next report. This information will be valuable as a guide to the management of any other sheep farms which may be started.

The pony stallion has covered a large number of mares, but it is not yet known whether he has been a successful foal-getter. The donkey stallion is apparently impotent and will be disposed of.

Mr. Hillier during the year visited portions of North and South Theinni with the pony stallion. He found that pony, mule, and cattle breeding was carried on to a considerable extent.

The Farm Superintendent, Mr. Hillier, has worked energetically and has, I think, done his best in the face of considerable difficulties. Mr. J. G. Scott, Superintendent of the Northern Shan States, reports favourably on Mr. Hillier. The annual report did not contain a statement of the actual financial results of the working of the farm during the year. Mr. Hillier has been directed to report this in future.

Distribution of seeds.

34. Wheat seed was supplied to the Deputy Commissioners of the Ruby Mines, Pyinmana, Upper Chindwin, Meiktila, Yamèthin, and to the Political Officer, Northern Chin Hills, and the Superintendent, Southern Shan States. The experiment in Pyinmana was on a large scale, 285 baskets of wheat being distributed as agricultural advances. Twenty-two cultivators sowed the seed, of whom six were successful; the fact that one cultivator obtained 216 baskets from 23 baskets sown shows conclusively that wheat can be grown in this district. It appears, however, from the Deputy Commissioner's report that the cultivators did not evince much interest in the experiment.

An experiment was made in the Lower Chindwin with 87 baskets of wheat which had been saved from the previous year's crop, but the sowing as a whole was a failure, the total outturn being 100 baskets. The failure was almost entirely due to the want of rain. A native of India obtained 30 baskets from 4 sown. Fifty-five baskets of wheat were supplied to the Upper Chindwin. Of these 47 baskets were sown and the total outturn was 73 baskets. The best outturn was 20 baskets from 5 sown. The season was very unfavourable owing to the failure of the latter rains. The cultivators as a whole do not appear to take much interest in the cultivation, but there is no doubt that wheat can be successfully grown in this district. In Meiktila 118 acres

were sown with wheat and the total outturn is stated to have been 2,029 baskets which was sold at Rs. 3 per basket. A basket of wheat weighs about 68 lbs., so that, if these figures are reliable the average outturn per acre was 1,169 lbs., a distinctly good result. The experiment in Yamèthin was not successful as a whole, but in one case 53 baskets of wheat were obtained from 2 pès (3½ acres) of land. The seed sent to the Ruby Mines apparently did not reach there, and owing to the absence of the Political Officer, Northern Chin Hills, on column duty, the seed sent to Fort White was not sown.

Although the experiments as a whole have not been very successful, still the success obtained in several cases shows that wheat can be grown in most districts of Upper Burma. Many district officers from their reports appear to be under the impression that the outturn of wheat should bear the same ratio to the seed sown as rice does. This of course is not the case; in the Central Provinces, where wheat is extensively grown, a good average outturn on unmanured and unirrigated land is 800 lbs. per acre from 100 lbs. seed sown.

A considerable amount of wheat seed was supplied to the Superintendent, Southern Shan States, who distributed it to cultivators, and from the results of this year's experiment he is hopeful that the Shans will take to wheat cultivation extensively. Part of the wheat was sown in September and was damaged by a very heavy fall of rain in the latter end of November and attacked by insects. Some was sown in November and is reported to have yielded 32-fold in one case, 15-fold in another, and was generally successful. I may remark here that I think September is too early for wheat sowing and that the end of October or the beginning of November is the right time to sow.

Arrangements have been made with the Commissariat Department by which the wheat produced and available for sale is taken over by that department at Mandalay rates. Last year 122 baskets were sold to the Commissariat Department and the cultivators who were successful have retained seed for the present year's sowing.

American maize seed was supplied to the places noted in the margin. The experiments were partly successful in Mandalay, Shwebo, Shwegyin, and Upper Chindwin. In Ye-u the crop failed owing to drought. In Pakôkku the crop is said to have failed owing to the seed being old. This is also the reason given for the failure in Shwegyin district, but as the seed had only been recently received from seedsmen in America and succeeded in many places, *e.g.*, Shwegyin town, the failure is probably due to other causes. In Shwebo part of the seed sown failed from want of rain. The seed sent to Toungoo was sent to Mr. Petley, who distributed it to the Karens in the Toungoo Hills. The cultivation was as usual successful and some specimen cobs, which were sent down by Mr. Petley, were very fine. In Tavoy the cultivation was carried out by the American Baptist Missionary, who sowed it after the rains and irrigated it. A fair crop was obtained, but he reports that it could not be sown in the rains in Tavoy. In the Shan States, although the seeds were received late, the cultivation was fairly successful, but the Superintendent says that the indigenous variety is so good that but little advantage would be gained from the introduction of American seed.

Mandalay.	Myingyan.	Shwebo.
Minbu.	Meiktila.	Shwegyin.
Tavoy.	Pakôkku.	Toungoo.
Yamèthin.	Lower Chindwin.	Tavoy.
Pyinmana.	Magwe.	Southern Shan States.
Upper Chindwin.	Ye-u.	

Reports from other districts have not been received.

Virginia tobacco seed was supplied to Mergui, Sandoway, and Minbu, and Havana seed to Minbu, Tavoy, and Sandoway. The Virginia tobacco succeeded in the Government plantation at Mergui, but failed elsewhere in the district; it was not a success either in the Minbu district, being stated to be inferior to the indigenous variety. The Deputy Commissioner, Mergui, reports that the American tobacco is not liked by the people owing to its being too mild. Reports from other districts have not been received. The seed of the *Eucalyptus globulus* was sent to Kyaukpyu. As a rule the sowing was unsuccessful, but some trees were obtained

which are being carefully tended, and the Deputy Commissioner is anxious to try the experiment again.

Egyptian cotton seed was supplied to the Deputy Commissioner, Sagaing, and the experiment was very successful, an excellent crop being obtained notwithstanding the deficient rainfall.

A large quantity of potatoes was obtained from India for the Superintendent, Southern Shan States. They, however, arrived at Fort Stedman in a bad condition, owing to their being allowed to lie at Meiktila Road station for several days, and the experiment was unsuccessful.

English vegetable seeds were distributed to a considerable number of districts, from only a few of which reports have yet been received; these show that the experiments were as a rule successful.

Deputy Commissioners and others to whom seeds were supplied were asked in May for a report of the results of the experiment, but a very large number have not as yet (September) submitted the required report.

Mergui experimental plantation.

35. *Coffee.*—Two small plots were cleared during the year and will be planted with coffee during the rains. The coffee plants were again attacked by leaf-disease, and although the plants gradually recovered, the outturn was diminished and the plants themselves were left in very poor condition. The coffee crop of the year amounted to 47·45 viss which, with the balance of 31·70 viss from last year, was nearly all sold. It has been decided that in future the coffee plantation is to be used merely as a source of supply for seedlings and seed.

Cocoa.—There are four large cocoa-plants; they are not in a healthy condition. There are also 48 seedlings which are strong and healthy, and will be put down during the rains.

Vanilla.—A large number of cuttings was taken from the plants this year. Some plants have been successfully fertilized. The cuttings, 201 in number, have taken root and are growing very well.

Tea.—The tea-plants were removed during the year to a situation on lower ground, and were improved thereby, although they are still somewhat scraggy.

Pepper.—As yet pepper cultivation has not been given a fair trial. An acre of ground has now been prepared, and the pepper-vine cuttings will be put down in the rains. A separate account is to be kept of receipts and expenditure on this cultivation, and if it can be proved that it is profitable, it is hoped that the Chinese and Burmese gardeners generally will take to it, as the method of cultivation is the same as for the betel-vine, which is already grown by them. The receipts of the garden from the sale of produce during the year amounted to Rs. 193-9-3 and the expenditure to Rs. 819-1-6, so that the net expenditure was Rs. 625-8-3.

Agricultural shows.

36. Agricultural shows were held in the Hanthawaddy, Tharrawaddy, Thôngwa, and Amherst districts in Lower Burma, and in Kyauksè and the Upper Chindwin districts in Upper Burma. The show at Insein in the Hanthawaddy district was very successful. The show in Tharrawaddy district was held at Minhla, and though distinctly more successful than the one held at Letpadan last year, the Deputy Commissioner says that it cannot be considered altogether a success.

The show held at Moulmein in the Amherst district was a failure owing to sufficient notice not having been given.

The show at Yandoon in the Thôngwa district was fairly successful, but the number of entries was not so large as at the show held at Danubyu in the previous year.

The show at Kyauksè was a failure owing, the Deputy Commissioner says, to the people being more interested in the Shwe Thayaing pagoda feast which was being held at the same time and to their not understanding the object of the show, which was the first held in the district. Two shows were held in the Upper Chindwin district, one at Mingin and the other at Yesagyo.

The funds for the latter were provided by private subscription, the object of it being to induce the Chins to bring down exhibits for competition and thus possibly lay the foundations of a future trade. Both these shows were very successful and great credit is due to Mr. Browne, Subdivisional Officer, who arranged the Yesagyo show.

SECTION V.

VETERINARY ESTABLISHMENT AND CATTLE-BREEIDNG.

37. For the reasons given in last year's report it was impossible to increase the staff of veterinary assistants which consequently remained the same as last year.

Veterinary school.

A very successful first year's work was done by the pupils of the Rangoon Veterinary school, and the examination passed by the large majority of them was distinctly creditable.

The only unsatisfactory point in connection with the school course is the want of subjects for the practical illustration of lectures. The present Veterinary Instructor and his Assistant are not allowed to take private practice, so that it is not easy to overcome the difficulty. The Financial Commissioner is in favour of the Instructor being allowed to do a limited amount of private practice. The thanks of the Financial Commissioner were conveyed to the Instructor and Assistant Instructor for their work during the year in connection with the school.

Cattle-disease.

The subject of cattle-disease in Lower Burma is fully dealt with in Part I of the Revenue Report. There is as yet no systematic registration of deaths of cattle in Upper Burma.

Breeding operations.

During the year there were eight Government stallions and two donkey stallions employed for stud purposes. The result of the horse-breeding operations cannot be said to be a success, and orders have lately been issued for the sale of some of the stallions which are practically useless. They will be replaced not by Arab but by Burman or Shan stallions. It is the opinion of the Veterinary Instructor and of most of the district officers who have a special knowledge of horse-breeding, that except for racing purposes the produce obtained from crossing Burman mares with Arab stallions is distinctly inferior to the pure Burman pony, and that it should be the object of Government to maintain and improve the breed of the pure Burman pony. It has accordingly been decided that the Arab stallions shall be gradually disposed of and their place taken by Burman or Shan stallions. It is, however, very difficult to obtain full grown Burman or Shan stallions, and it will probably be necessary to purchase colts and keep them until they are fit for stud purposes. The four Shan colts referred to in last year's report have improved greatly during the year and are now very fine animals. The Burman pony is a bad tempered beast and difficult to manage; he will be disposed of if he does not improve shortly. The donkey stallions received from India appear to be useless and will shortly be disposed of.

The Military Police ponies are now part of the charge of the Veterinary Instructor; they number in all 2,918 ponies. The general health of the animals is said to have been good. This is fortunate, as with the present very limited staff of Veterinary Assistants, and having regard to the various other duties he has to perform, it would scarcely be possible for Mr. Evans to efficiently deal with these animals in the event of serious outbreaks of disease.

SECTION VI.

38. The weekly crop reports and monthly statements of rainfall have been submitted as usual and compiled in the office of the Director of Land Records. Very little care is taken in district offices in the compilation of the rainfall returns and nearly every week references have to be made to various districts asking for explanations of discrepancies.

During the year several new Symons' rain-gauges and measuring gauges of the standard pattern have been distributed and all existing rain registering stations are now supplied with these.

In view of the very unequal distribution of rain which appears to prevail in most parts of Upper Burma and of the great importance of knowing the rainfall of all considerable tracts which are liable to scarcity, Commissioners and Deputy Commissioners have been asked to report the additional stations at which they think that rain-gauges should be established.

SECTION VII.

Trade registration.

39. The registration of the trade between Upper and Lower Burma was continued during the year in the same way as during the previous year. Proposals were submitted for the resumption of the registration of the boat trade at Allanmyo and Toungoo and for the re-opening of the land registration stations in the Thayetmyo and Toungoo districts. These proposals were sanctioned by the local Government and the extended registration was begun from 1st May 1892. A scheme for the registration of the inland trade of the town of Rangoon was elaborated and submitted to the local Government, but it was also represented that the practical difficulties in the way of the working of the proposed or any scheme of registration were very great and the cost excessive compared with any real advantage which could be gained by the registration. These views commended themselves to the local Government and the question is now believed to be before the Government of India.

The registration of the trade of Burma with the adjoining foreign countries was continued during the year. The number of registering stations in Upper Burma was five, the same as during the previous year. Some minor changes, however, were introduced in the distribution and strength of the establishment. In Lower Burma two registering stations were closed owing to the volume of trade registered at them being insignificant, and one station was transferred to a neighbouring village.

The work in the trade department of the office of the Director of Land Records is very heavy, but it was efficiently carried out by the Head Assistant, Mr. Claridge, who received an increase of pay during the year for his good work.

Crop estimate.

40. Estimates of the rice-crop were made in the same way as was described in last year's report. The final estimate made in February was that 1,250,500 tons of cargo rice would be available for export. In April 1892 the accuracy of this estimate was questioned by some of the rice merchants in Rangoon who stated that the probable available surplus would be only 1,050,500 tons, subsequently, however, raising it to 1,117,000 tons.

It was believed that cultivators warned by the experience of last year were hoarding up stocks and enquiries were made from Deputy Commissioners as to the stocks of paddy in hand. The information obtained in response, however, proved to be unreliable. Messrs. Bulloch Brothers in their review of the rice trade for August estimate the total available surplus for export at 1,255,000 tons (which is practically the same as the Government estimate) and show that actual exports up to the end of August amounted to 1,118,085 tons. It is probable therefore that the Government estimate will prove to be nearly correct.

SECTION VIII.

41. I was in charge of the department during the year under report.

Maung Po Byu, Superintendent of Land Records, Henzada, reverted to the regular line during the year under report, and Maung Ba On, who had been acting for him, was confirmed in the appointment. Mr. Munro, Superintendent, Tharrawaddy, was transferred to Thôngwa during the year, his place being taken by Mr. L. E. Palmer, who was newly appointed to the department as Superintendent of Land Records.

T. C. WILSON,

Officiating Director of the Department of Land Records and Agriculture.

The 14th September 1892.

APPENDICES.

General Circular No. 17 of 1889.

From W. T. HALL, Esq., Director of the Department of Land Records and Agriculture, Burma, to the Commissioners of the Arakan, Pegu, Irrawaddy, and Northern Divisions,—No. 519-18P., dated the 31st December 1889.

UNDER section 41A. of the Directions to Revenue Officers concerning Supplementary Survey (Revised Edition—November 1889) thugyis are required to have all survey marks which are reported damaged or lost, replaced without delay. This should be done in every kwin annually. They are also required to visit some of the marks reported to be in good order. They cannot inspect all such pipes annually, and it will therefore be necessary for Superintendents to make arrangements which will ensure all survey marks being visited by the thugyis at regular intervals. This can without difficulty be done once in three years. And in order that the work may be carried on systematically, Superintendents should without delay divide each circle into three portions and mark each with a different colour on an index map. Each thugyi should get a copy of the map so coloured, and should be informed in what block of kwins the thorough inspection of the survey marks by him is to take place in the present year. The circles should for this purpose be divided in such a way that each block will contain about the same number of survey marks, and also a fair proportion of those kwins in which the work of inspecting the marks is difficult. Column 18 in the monthly progress report should be subdivided and the following headings substituted for the present one, namely,—

(*a*) total number of survey marks in each circle;

(*b*) number of survey marks in the block selected for survey this year.

It should be clearly understood that while the thugyi is no longer called on to visit all the marks reported to be in good order annually, he should each year replace all lost or damaged marks without fail.

General Circular No. 5 of 1891.

Subject.—Preservation and maintenance of permanent survey marks.

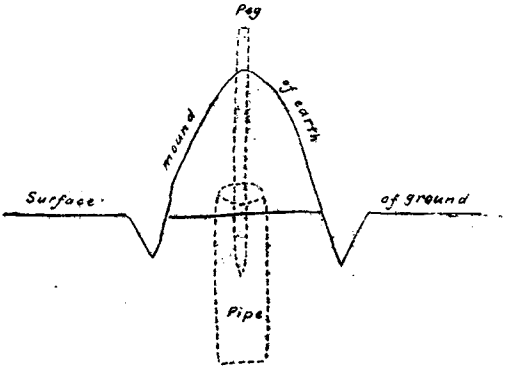
THE Report on the Department of Land Records and Agriculture for the year 1889-90 shows (page viii of the Appendices) that out of a total of 87,734 permanent survey marks in the seven settled districts of Lower Burma no less than 24,892 are returned as broken or missing, and of this number only 8,905 were replaced.

It is obvious that, if this rate of destruction continues, there will shortly be very few permanent marks left on the ground at all.

2. The preservation of the permanent survey marks is a matter of the utmost importance, they are constantly required for reference during the progress of the annual supplementary survey operations, and at the end of the term of settlement will be essential in all cases where it is necessary for a kwin to be resurveyed.

3. In some cases no doubt the permanent marks are wilfully destroyed, and in all such cases strenuous efforts should be made to discover the offender and prosecute him under the criminal law.

Large numbers are, however, accidentally broken and destroyed by cattle, carts, &c., or by the people themselves during the progress of agricultural operations; and, in order to ensure their better preservation, I have the honour, with the sanction of the Financial Commissioner, to direct that all permanent survey marks, except such as are situated on public roads and thoroughfares, railway, and such other places, where the erection of mounds would be impracticable, shall be protected by means of mounds of earth 3 feet high raised over each with a 4 or 5 feet wooden peg in the centre and a trench dug all round as in the diagram given below.



This work can be done under the orders of the Deputy Commissioner by thugyis or ywathugyis with the assistance of the villagers and should be attended to with the least possible delay.

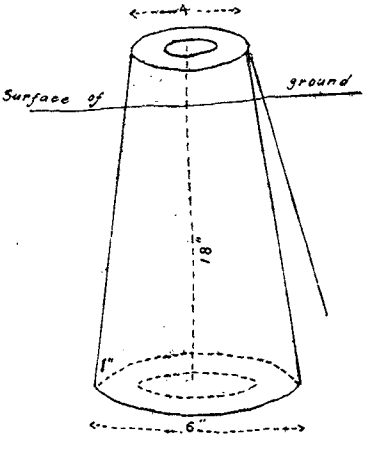
A report should be sent in to this office monthly showing the progress made in the erection of the mounds.

4. Another point of importance in which it has become necessary to issue revised orders is that of the kind of mark to be used for replacing those permanent survey marks which are found to be lost or broken. It is essential that there should be a distinction made between the marks originally put down by the Survey of India Department and those put down to replace lost or broken marks. The former are undoubtedly in their right positions, whereas there is danger of mistakes being made by thugyis when putting down new marks, and a very small error in position renders a mark useless as a basis for theodolite work, although it may serve perfectly well for supplementary survey purposes.

5. The marks used by the Survey of India for permanently marking theodolite stations in all districts, except Akyab, have been cylindrical clay pipes of varying sizes.

In Akyab triangular stone pillars have been used. I have therefore the honour to direct that in future the marks to be used by the Land Records Department for replacing lost or broken marks (in all districts except Akyab) shall be in the shape of the section of a cone, as in the figures given below, and of the following dimensions :—

Eighteen inches long, 4 inches outer diameter at top, and 6 inches outer diameter at bottom, and the thickness of the clay to be 1 inch.



The mark when embedded should project from 4 to 6 inches above the ground. In Akyab a sufficient distinction can be made by using a stone pillar with a square section instead of the present triangular shaped one.

6. In conclusion I have the honour to point out and reiterate the great and urgent necessity for vigilance on the part of district authorities in the matter of the preservation of permanent survey marks, and the enforcing of the responsibility of village headmen and landholders in all cases of wilful destruction or damage.

T. C. WILSON,

Offg. Director of the Department of Land Records and Agriculture.

RANGOON:
The 18th August 1891.

DEPARTMENT OF LAND RECORDS AND AGRICULTURE.

A.—*Area under Supplementary Survey and Cost of the Operations*

1	2		3		4		5		6		7		8		9		10
District.	Number of circles.		Total area in square miles.		Area assessed or held under temporary exemption. Paddy.		Garden and miscellaneous cultivation.		Total.		Actual cost of supplementary survey operations.		Cost per square mile of total area.		Cost per acre shown in column 6.		Remarks.
	1890-91.	1891-92.	1890-91.	1891-92.	1890-91.	1891-92.	1890-91.	1891-92.	1890-91.	1891-92.	1890-91.	1891-92.	1890-91.	1891-92.	1890-91.	1891-92.	
					Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs. A. P.	Rs. A. P.	Pies.	Pies.	
Pegu ...	37	38	2,018	2,019	763,385	779,552	12,122	12,476	775,507	792,028	16,190	16,345	8 0 4	8 1 6	4·01	3·96	
Hanthawaddy ...	35	37	1,476	1,818	466,414	514,423	33,900	36,292	500,314	550,715	14,184	16,275	9 9 9	8 15 3	5·44	5·67	
Tharrawaddy ...	25	27	1,096	1,211	317,098	332,076	12,836	17,768	329,934	349,844	12,245	10,792	11 2 9	8 14 7	7·13	5·92	
Prome ...	43	52	801	1,266	223,066	258,985	25,735*	34,778	248,801*	293,763	10,534	11,894	13 2 5	9 6 4	8·13	7·77	
Bassein ...	51	57	2,372†	2,603	530,858†	571,133	26,830†	28,095	557,688†	599,228	17,891	19,747	7 8 8	7 9 5	6·16	6·33	
Henzada ...	45	51	1,402	1,785	345,478	378,369	46,070	33,360	391,548	411,729	13,162	13,153	9 6 2	7 5 11	6·45	6·13	
Akyab ...	74	74	1,839	1,839	443,333	459,485‡	27,495	27,776	470,828	487,261	13,237	13,078	7 3 2	7 1 9	5·40	5·15	
Thôngwa ...	5	19	437*	1,461	56,230	179,537	6,152	43,147	62,382	222,684	2,446	7,857	5 9 6	5 6 0	7·53	6·77	
Total ...	315	355	11,441	14,002	3,145,862	3,473,560	191,140	233,692	3,337,002	3,707,252	99,889	109,141	8 11 8	7 12 9	5·75	5·65	

* Revised figures. | † Includes the new tract brought under supplementary survey. | ‡ Exclusive of 1,990 acres of taungya-cultivation.

B.—*Assessments in the Tracts under Supplementary Survey.*

District.	Paddy-land.		Garden and miscellaneous.		Total.		Remarks.
	1890-91.	1891-92.	1890-91.	1891-92.	1890-91.	1891-92.	
1	2	3	4	5	6	7	8
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Pegu	15,45,033	15,71,916	25,950	27,036	15,70,983	15,98,952	
Hanthawaddy	10,43,039*	11,39,756	99,775*	88,896	11,42,814*	12,28,652	
Tharrawaddy	5,50,164	5,86,904	28,535	37,751	5,78,699	6,24,655	
Prome	2,17,884	2,67,023	59,224	72,860	2,77,108	3,39,883	
Bassein	7,66,569	8,88,848	53,668	69,059	8,20,237	9,57,907	
Henzada	6,21,117	6,99,418	83,520	80,373	7,04,637	7,79,791	
Akyab	9,22,235*	9,52,142†	53,929	54,404‡	9,76,164*	10,06,546§	
Thôngwa	1,18,646	2,96,054	15,270	87,221	1,33,916	3,83,275	
Total ...	57,84,687	64,02,061	4,19,871	5,17,600	62,04,558	69,19,661	

* Revised figures.
† Includes Rs. 995 taungya-tax.
‡ Includes Rs. 30 fruit tree-tax.
§ Includes Rs. 30 fruit tree-tax and Rs. 995 taungya-tax.

C.—*Agency by which the Supplementary Survey was conducted.*

District.	Number of circles.	Number of thugyis who have qualified in surveying.	Number of thugyis who actually took part in supplementary survey.	Number of circles in which thugyisayès were employed.	Number of circles in which it was necessary to employ two thugyisayès.	Remarks.
1	2	3	4	5	6	7
Pegu ...	38	31	37	6	9	* Temporarily for three days.
Hanthawaddy ...	37	32	37	36	15	
Tharrawaddy ...	27	21	14	26	14	
Prome ...	52	18	8	51	8	
Bassein ...	40	24	15	40	21	
Henzada ...	51	33	33	44	2	
Akyab ...	74	16	11	67	2*	
Thôngwa ...	19	9	4	19	9	
Total ...	338	184	159	289	80	

D.—*Supplementary Survey Inspection.*

District.	Year.	Number of kwins in tract supplementary under survey.	Number of kwins in which the field work was checked by the Superintendent.	Work done by Inspectors.			Total number of kwins, the field work of which was checked by Land Records staff.	Number of kwins, the field work of which was checked by the Deputy Commissioner.	Work done by Sub-divisional Officers.			Work done by Township Officers.		
				Number of Inspectors.	Number of kwins checked.	Average.			Number of Sub-divisional Officers.	Number of kwins checked.	Average.	Number of Township Officers.	Number of kwins checked.	Average.
Pegu ...	1890-91	917	62	4	375	94	425	5	1	13	13	5	40	8
	1891-92	924	82	4	428	107	509	21	2	18	9	5	91	18
Hanthawaddy ...	1890-91	1,003	95	4	459	115	504	46	1	6	6	4	41	10
	1891-92	1,305	128	4	550	137	619	72	1	8	8	4	65	16
Tharrawaddy ...	1890-91	449	76	4	206	51	282	8	2	17	8	5	11	2
	1891-92	566	77	4	318	79	395	26	2	11	5	5	18	4
Prome ...	1890-91	465	80	3	245	82	325	2	1	2	2	4	15	4
	1891-92	772	119	4	292	73	411	21	3	32	11	4	28	7
Bassein ...	1890-91	1,202	112	7	543	78	571	31	4	4	1	8	53	7
	1891-92	1,388	159	8	809	101	782	14	4	30	7	8	64	8
Henzada ...	1890-91	626	56	5	322	64	350	16	4	39	10	6	75	12
	1891-92	835	105	5	382	76	487	26	4	43	11	6	102	17
Akyab ...	1890-91	1,010	57	5	476	95	533	6	3	16	5	5	37	7
	1891-92	1,010	59	5	459	92	518	7	3	21	7	5	30	6
Thôngwa ...	1890-91	...	66	...	...	...	...	2	1	4	4	1	7	7
	1891-92	521	40	4	211	53	251	...	1	5	5	2	11	5
Total ...	1890-91	5,672	604	32	2,626	82	2,990	116	17	101	6	38	279	7
	1891-92	7,321	769	38	3,449	72	3,972	187	20	168	8	39	409	10

E.—*Result of Corrections.*

District.	Effect of correction.							
	Total increase.		*Total decrease.*		*Net increase.*		*Net decrease.*	
	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.
1	2	3	4	5	6	7	8	9
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Pegu ...	298	742	64	875	234	...	...	133
Hanthawaddy ...	170	383	15	29	155	354	...	...
Tharrawaddy ...	357	631	79	178	278	453	...	...
Prome ...	220	301	7	123	213	178	...	...
Bassein ...	1,394	3,100	220	1,512	1,174	1,588	...	...
Henzada ...	363	687	68	199	295	488	...	...
Akyab ...	372	1,061	44	433	328	628	...	...
Thôngwa ...	361	941	439	1,106	...	...	78	165
Total ...	3,535	7,846	936	4,455	2,599	3,391	...	...

F.—*Table showing the nature of Errors found by the Superintendents and Inspectors.*

(*a*) New plots wrongly surveyed.

District.	Number of new fields or plots checked by Superintendent or Inspector.	Number of such plots in which errors were found.			Remarks.
		Errors amounting to ½ an acre or more.	Errors of less than ½ an acre.	Total number of errors.	
1	2	3	4	5	6
Pegu ...	1,897	65	192	257	
Hanthawaddy ...	1,318	88	152	240	
Tharrawaddy ...	1,232	92	514	606	
Prome ...	2,451	55	104	159	
Bassein ...	2,569	133	258	391	
Henzada ...	177	36	79	115	
Akyab ...	1,599	42	306	348	
Thôngwa ...	203	93	81	174	
Total ...	11,446	604	1,686	2,290	

(*b*) Omissions to survey new plots.

District.	Number of new plots found not surveyed.			Remarks.
	Errors amounting to ½ an acre or more.	Errors of less than ½ an acre.	Total number of errors.	
1	2	3	4	5
Pegu	91	575	666	
Hanthawaddy	125	591	716	
Tharrawaddy	58	465	523	
Prome	75	308	383	
Bassein	596	1,612	2,208	
Henzada	143	599	742	
Akyab	90	894	984	
Thôngwa	...	...	...	
Total ...	1,178	5,044	6,222	

F.—*Table showing the nature of the Errors found by the Superintendents and Inspectors*—continued.

(*c*) Errors in marking fallows.

District.	Number of fields marked fallow that were checked.	Fallow fields shown as cultivated.			Cultivated fields shown as fallows.			Remarks.
		Errors amounting to ½ an acre or more.	Errors of less than ½ an acre.	Total number of errors.	Errors amounting to ½ an acre or more.	Errors of less than ½ an acre.	Total number of errors.	
1	2	3	4	5	6	7	8	9
Pegu ...	16,654	323	982	1,305	52	113	165	
Hanthwaddy ...	10,237	82	450	532	35	95	130	
Tharrawaddy ...	13,880	77	1,098	1,175	26	135	161	
Prome ...	12,195	245	1,481	1,726	49	165	214	
Bassein ...	38,898	874	3,950	4,824	297	903	1,200	
Henzada ...	9,300	160	2,213	2,373	69	661	730	
Akyab ...	32,983	22	3,469	3,491	33	595	628	
Thôngwa ...	1,752	250	1,105	1,355	16	91	107	
Total ...	135,899	2,033	14,748	16,781	577	2,758	3,335	

(*d*) Lands wrongly classified and errors in field boundaries in the interior of holdings.

District.	Classification of land.		Interior holding boundary errors.		Remarks.
	Number of holdings visited.	Number of holdings in which land was found wrongly classified.	Number of boundaries checked.	Number of boundaries in which errors were found.	
1	2	3	4	5	6
Pegu ...	2,592	55	4,272	136	
Hanthawaddy ...	9,241	38	9,241	121	
Tharrawaddy ...	9,251	259	73,913	7,954	
Prome ...	2,024	39	4,755	488	
Bassein ...	9,689	54	10,896	482	
Henzada ...	6,417	45	38,924	1,505	
Akyab ...	2,269	40	19,317	428	
Thôngwa ...	57	...	413	164	
Total ...	41,540	530	161,731	10,378	

F.—*Table showing the nature of the Errors found by the Superintendents and Inspectors* — concluded.

(*e*) Errors in noting sales, transfers, and sub-letting of land.

District.	Tenant statistics.		Statistics of sales, transfers, mortgages, &c.		Kazin errors.		Others.	
	Number of cases of sub-letting checked.	Omissions to note, or errors in showing tenancies.	Number of cases in which sales, transfers, and mortgages were checked.	Omissions to show, or errors in noting terms of sales, transfers, and mortgages.	Number of fields checked.	Number of errors.	Number of fields checked.	Number of errors.
1	2	3	4	5	6	7	8	9
Pegu	2,794	200	2,079	103	88,239	2,244	1,248	138
Hanthawaddy ...	1,695	256	616	168	139,735	6,344	460	353
Tharrawaddy ...	2,352	309	1,230	191	...	...	13,734	866
Prome	2,793	255	2,780	217	...	833	...	362
Bassein	3,170	677	745	146	191,041	5,515	2,917	694
Henzada	3,729	922	601	258	88	14	289	141
Akyab	2,009	349	779	194	382,704	7,259	7,878	407
Thôngwa	281	...	71	...	...	...	1,529	696
Total ...	18,823	2,968	8,901	1,277	801,807	22,209	28,055	3,657

G.—*Condition of the Permanent Survey-marks.*

District.	Total number of permanent survey-marks in the district.	Number of marks visited by thugyis and taiksayès.	Number of marks		Number of marks		Remarks.
			Found broken.	Replaced.	Missing.	Replaced.	
1	2	3	4	5	6	7	8
Pegu	12,122	7,049	1,908	1,908	1,584	1,528	
Hanthawaddy ...	16,992	6,782	1,925	1,749	1,104	1,088	
Tharrawaddy ...	10,832	4,484	461	314	713	440	
Prome	21,915	4,582	2,779	1,632	1,548	1,064	
Bassein	27,967	12,571	1,670	1,670	2,221	2,221	
Henzada	28,974	14,685	2,119	788	2,109	1,060	
Akyab	11,106	8,008	682	632	485	425	
Thôngwa	17,757	7,635	1,653	143	184	...	
Total ...	147,665	65,796	13,197	8,836	9,948	7,826	

H.—*Thugyis Commission and Thugyis' Assistants' Salaries.*

District.	Number of thugyis.	Year.	Total area assessed or held under temporary exemption.	Thugyis' commission. On land revenue.	Thugyis' commission. On capitation-tax and other taxes or rates.	Thugyis' commission. Total.	Deductions made from thugyis' commission. For thugyisayès. Number.	Deductions made from thugyis' commission. For thugyisayès. Amount per annum.	Deductions made from thugyis' commission. Chainmen.	Deductions made from thugyis' commission. Total.	Balance paid to thugyis.	Remarks.
			Acres.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	
Pegu	38	1890-91	775,507	79,651	25,734	1,05,385	44	17,803	2,726	20,529	84,856	
	38	1891-92	792,028	88,452	26,881	1,15,333	48	18,570	2,829	21,399	93,934	
Hanthawaddy	35	1890-91	500,314	59,664	22,345	82,009	34	14,703	...	14,703	67,306	
	37	1891-92	550,715	65,701	25,195	90,896	36	14,233	...	14,233	76,663	
Tharrawaddy	25	1890-91	329,934	28,044	20,685	48,729	42	14,123	2,902	17,025	31,704	
	27	1891-92	349,844	30,945	22,474	53,419	41	13,962	4,788	18,750	34,669	
Prome	49	1890-91	248,801*	15,726	23,717	39,443	31	10,717	2,505	13,222	26,221	
	49	1891-92	293,763	18,467	28,114	46,581	41	12,558	3,108	15,666	30,915	
Bassein	34	1890-91	557,688†	45,034	23,363	68,397	51	19,620	8,778	28,398	39,999	
	40	1891-92	599,228	70,771	27,311	98,082	60	20,944	8,578	29,522	68,560	
Henzada...	41	1890-91	391,548	33,179	30,617	63,796	36	11,754	2,904	14,658	49,138	
	47	1891-92	411,729	35,443	32,877	68,320	40	13,957	2,782	16,739	51,581	
Akyab	74	1890-91	470,828	58,259	30,148	88,407	51	22,024	3,076	25,100	63,307	
	74	1891-92	487,261	59,365	30,826	90,191	52	21,782	3,255	25,037	65,154	
Thôngwa	5	1890-91	62,382	6,949	4,008	10,957	5	1,270	396	1,666	9,291	
	19	1891-92	222,684	26,867	15,687	42,554	19	6,180	2,597	8,777	33,777	
Total ...	301	1890-91	3,337,042	3,26,506	1,80,617	5,07,123	294	1,12,014	23,287	1,35,301	3,71,822	
	331	1891-92	3,707,252	3,96,011	2,09,365	6,05,376	337	1,22,186	27,937	1,50,123	4,55,253	

* Revised figures. | † Includes the new tract brought under Supplementary survey.

I.—*Survey Examinations in Lower Burma.*

District.	Number of candidates who passed in				Remarks.
	October 1891.		*April 1892.*		
	From Government Survey schools.	From other schools or private students.	From Government Survey schools.	From other schools or private students.	
1	2	3	4	5	6
Akyab	8	3	6	1	
Kyaukpyu	2	...	2	...	
Sandoway	...	...	...	...	
Rangoon	...	20	...	...	
Hanthawaddy	...	5	...	...	
Pegu	27	10	3	3	
Tharrawaddy	15	3	3	1	
Prome	24	9	4	...	
Bassein	7	5	1	...	
Thôngwa	7	1	2	...	
Henzada	5	3	3	...	
Thayetmyo	...	1	...	...	
Amherst (Moulmein) ...	...	10	...	...	
Shwegyin	...	2	...	...	
Toungoo	...	...	...	...	
Total ...	95	72	24	5	

II.—*Survey Examinations in Upper Burma.*

District.	Number of candidates who passed in				Remarks.
	July 1891.		*May 1892.*		
	From Government Survey schools.	From other schools or private students.	From Government Survey schools.	From other schools or private students.	
1	2	3	4	5	6
Mandalay	8	...	22		
Bhamo	...	...	...		
Katha	...	...	...		
Shwebo	...	...	...		
Ruby Mines	...	...	...		
Ye-u	...	...	...		
Sagaing	8	...	8		
Lower Chindwin	...	...	...		
Upper Chindwin	...	...	...	16	
Myingyan	...	...	...		
Pakôkku	...	...	...		
Minbu	...	...	4		
Magwe	...	...	...		
Kyauksè	6	...	14		
Meiktila	...	...	...		
Yamèthin	3	...	12		
Pyinmana	...	...	...		
Total ...	25	...	60	16	

EXTRACTS FROM THE REPORT ON THE OPERATIONS OF THE LOWER BURMA FIELD-TO-FIELD SURVEY BY LOCAL AGENCY PARTY FOR THE YEAR 1891-92.

CADASTRAL SECTION.

Last year's recess-work.

THE whole of the map and office work with the exception of the 2-inch reductions relating to the survey of the 1,441 square miles of country executed by the party during the previous season was completed for the most part by the end of November last. This consisted of the inking-in, numbering, printing, and typing of the 16-inch sheets (of which there were no less than 1,935), the preparation of the area statements in duplicate, the completion of the registers, and first year's maps for supplementary survey offices, the writing up of the usual abstracts and indices for the office, and the preparing of the 16-inch maps for lithography. * * * * * * * * *

Supplementary survey of tracts surveyed field-to-field.

2. In accordance with the practice that has prevailed hitherto in reference to the work of the Local Agency Party, of starting the supplementary survey in the year immediately following that of the field-to-field survey, the Financial Commissioner ordered that in the event of the Commissioners of Pegu and Irrawaddy having no objections in the matter the supplementary survey of the tracts which were surveyed by Local Agency in 1890-91 should be commenced in 1891-92, especially as it it did not appear that there was any necessity for varying the current rates of assessment. In terms of these orders, therefore, the requisite settlement traces, holding registers, area statements and published 16-inch maps with the holdings, &c., marked thereon in pencil for the first year's supplementary survey relating to more than one-half of the work were forwarded direct to the Deputy Commissioners concerned on the 1st December 1891, and the balance at different other times by the 11th idem. * * * * * * * *

Preliminary arrangements.

3. As the area sketched out for survey during the year was about the same as that of which the survey was accomplished in the year preceding arrangements were made for organizing a Field party of at least equal strength to the last. There were accordingly employed, with effect from the 1st December 1891, the date on which it was decided to start field-work, in addition to 4 officers,—8 inspectors, 96 field surveyors, and 24 clerks, draughtsmen, holding-markers, tracers, &c. These included the hands that had worked as computors and mappers during the recess-season, as well as those of the field surveyors who were furnished with leave-pay certificates at the conclusion of the previous field-season, and who now returned for re-employment. The services of several outsiders possessing the requisite certificates of qualification in surveying were also secured to complete the establishment. Among the field surveyors there were eight Hindustanis, six of whom had worked the previous season. This class of workers is taken on to awaken a spirit of emulation which lies dormant within the Burman breast unless roused to action by some such means; and it is proposed, if all goes well, to even double this number in the coming year by giving each inspector two such men in his division. * * * * *

Taking the field.

4. Two detachments only were formed this year to correspond with the same number of Traverse camps that were to be employed on the work of the season. These were the camps known before as 2 and 3, but numbered afresh as 1 and 2 respectively. The old Camp No. 1 was broken up and its members transferred partly to the traverse side, and the remainder to Camps 1 and 2. Camp No. 1 was in charge of Myoôk Maung Pyu Than, and was to work in the Prome and Thayetmyo districts, while Camp No. 2 was put under Myoôk Maung Tun for work in the Thôngwa and Bassein districts. Both these camps were fully equipped, and as they would have a sufficient number of 16-inch plots in hand to keep them amply occupied for the space of about two months, were despatched to their respective destinations at Myodaung and Kyaikpi,—No. 1 on the afternoon of the 1st December and No. 2 on the forenoon of the 29th November.

5. * * * * *

Commencement of field-work and training of hands.

6. The field-work of Camp No. 1 was not quite begun till a week after its arrival at its centre of operations. The Hindustani surveyors were sent out without delay, but the Burman surveyors and inspectors were detained in camp for a few days to complete certain documents relating to the Prome work of the previous year, which should have

been brought up during the recess, but which were not so brought up owing to the fact that the area statements of many of the kwins could not be finally passed, within percentage, due to the errors of working of the new contract hands, and also to the map work being unusually heavy. This delay was unfortunate, but was unavoidable. The survey work of this camp was at the commencement of the season confined to the tracts in the Prome district of which plots had been or were soon to be furnished by No. 12 Party, Survey of India, and of which the traverse survey had been completed the previous year. The detail survey in Prome was finished by the middle of February when the camp was shifted to Kama for work in the Thayetmyo district, on the plots which were to be provided to it there by the Local Traverse Camp No. 3. Here it continued to work till the closing of field operations on the 26th June, when it left for Rangoon, where it arrived on the 30th idem. Camp No. 2 reached its destination on the 30th November and started survey operations on the 3rd December on the plots relating to Kyôntôn circle of the Thôngwa district which were sent to it on the previous day by the Local Traverse Camp of the place. Having finished the survey here this camp was successively shifted to Kyunpyathat on the 11th January, for the work in Kyunpyathat and Labutchan South circles of Thôngwa, thence to Thamandewa, in the Bassein district, on the 17th February, for work on the triangulation system there, then to Labutta, on the 3rd April, for work in the southernmost circles of the same district, on the plots supplied to it by Traverse Camp No. 4, and finally to Rangoon, by special steamer, after closing of field operations on the 26th May, on the 31st of the same month. A number of the hands taken on in the year were raw to the work, and had to be trained in the field by the Myoôks and Inspectors. Several of their sheets had to be rejected at first, but after a time they improved and began submitting good work.

Receipt of traverse plots.

7. Traverse plots were received in sufficient numbers by Camp No. 1 throughout the working season, but it was not found possible to provide Camp No. 2 for a time with enough to keep all its hands engaged after the sheets relating to the Thôngwa district had been completely done with, and it was for this reason that a small portion of country had to be surveyed on the triangulation system in the Bassein district. After a while, however, an ample supply of sheets was made available, which kept the camp fully occupied till the end of the field term.

Survey on the triangulation system.

8. A survey on the triangulation method had to be prosecuted during the year over an area of 91·13 square miles of country, appertaining to 74 kwins, in the Thamandewa circle of the Bassein district. This was necessitated, in consequence of Traverse Camp No. 4 being unable, for reasons which will be described hereafter, to keep it provided, for a brief time, with a supply of sheets in keeping with its copious requirements. The whole of Camp No. 2 was employed on this particular description of survey for the space of a little over a month. The work was laborious and necessarily slow, owing to the limited number of men available for line-cutting, but it was remarkably correct in all four of the inspectors' divisions, as proved by the check lines taken over the ground by the Inspecting Officers. This triangulation system consisted of the detail survey working in advance of the traverse, by laying out a series of large and well-formed triangles in the kwins under survey on which the detail work was to be built up, and marking on the ground in a fairly lasting manner the more important stations, adopted as such by the detail survey, which would be subsequently picked up as theodolite stations by the Sub-Surveyors of the Traverse Survey. In Camp No. 1 the survey on the triangulation system was attempted of 12 kwins, having an area of 10 square miles, in the Mindôn circle of the Thayetmyo district. It was undertaken through a misapprehension on the part of the Myoôk in charge, and should never have been attempted, as Traverse Camp No. 3 was in a position at the time to supply as many sheets as were likely to be required by the field surveyors of the detail survey camp. Neither the Myoôk nor the Inspector in charge of the squad doing the work visited the locality under survey, with the only but natural result that the work was found to be inferior in quality and had consequently to be rejected *in toto*. The Superintendent's timely visit of inspection paid to this camp prevented, what might have proved to have been serious consequences. Both the officers concerned in this matter were for this, as well as other faults, reduced and removed to other and less important spheres of work. In the Prome district one kwin, with an area of 0·99 square mile, was also surveyed on the triangulation system. This was done to fill up an omission merely, as the kwin was considered to be worth surveying field-to-field, but the plot relating to it was not received. The adoption of the triangulation system in Bassein, although it helped to find work for the members of Camp No. 2 who would otherwise have been kept in comparative idleness for a short time, has also tended to slightly enhance the cost of operations, firstly, in the extra time taken for the survey of a kwin, in the selecting, measuring, and laying out of the triangles on the ground; and, secondly, in the additional labour, which this description of work necessitates, of inking-up such sheets and copying them afresh on the 16-inch plots which are subsequently received from the Traverse camp.

Tracts surveyed in previous years, those surveyed this year, and those remaining for survey.

9. The areas of these various tracts, see Map **A**, for each of the districts named below are as under.

District.	Excluded area.	Area surveyed in 1889-90.	Area surveyed in 1890-91.	Area surveyed in 1891-92.	Area for survey in 1892-93.	Total area.	Remarks.
	Sq. Miles.	Sq. Miles.	Sq. Miles.	Sq. Miles	Sq. Miles.	Sq. Miles.	
Hanthawaddy ...	...	67·41	340·85	...	...	408·26	
Henzada ...	19·30	...	416·81	...	...	436·11	
Tharrawaddy ...	24·32	...	126·25	...	...	150·57	
Prome ...	391·90	111·03	483·50	367·41	41·78	1,395·62	
Bassein ...	623·46*	105·52	73·12	598·09	88·21	1,488·40	* Includes 100 square miles falling inside of main circuits.
Thôngwa ...	...	...	...	267·91	...	267·91	
Thayetmyo ...	210·24†	...	...	332·19	218·76	761·19	†Falls inside of main circuits.
Kyaukpyu ...	...	...	...	...	900·00	900·00	Approximate areas.
Sandoway ...	...	...	...	...	400·00	400·00	
Total ...	1,269·22	283·96	1,440·53	1,565·60	1,648·75	6,208·06	

These figures are in accordance with the Survey Conference Programmes of 1889 and 1891 and subsequent orders. Of the 1,565·60 square miles surveyed in detail by Local Agency this year, 367·41 square miles of Prome were completed on the plots furnished by No. 12 Party during the year of survey and the previous one, 131·86 square miles, in Thôngwa, on the plots prepared by Traverse Camp No. 4 with the data obtained from No. 7 Party, and the remainder on the plots provided by the Local Traverse Camp. * * *

10. * * * * *

Health of detachments.

11. The health of the Cadastral camps was far from satisfactory. There was a good deal of sickness in both of them, at the commencement as well as towards the close of the field-season. In Camp No. 1, however, only one khalassi succumbed to an attack of fever, but in Camp No. 2, there were no less than 7 deaths, namely, 1 field-surveyor and 2 khalassis from cholera in the Thôngwa district, and 2 khalassis from ordinary fever, and 2 from malarial fever in the Bassein district; besides these, after the arrival of the camp at Rangoon, 1 more field-surveyor and 10 more khalassis died from attacks of a malarial fever contracted on the Pyinkayaing side of the Bassein district, while 2 field-surveyors and 1 holding-marker are even now so ill from the same cause that they are not expected to recover. In addition to this number, 19 field-surveyors have been invalided owing to this terrible fever, and have gone to their homes on leave. It is needless to say that had these casualties occurred while the camp was out in the field, they would have simply proved disastrous to the work. The usual supply of medicines was obtained on indent from the medical stores before taking the field, but these, owing to the heavy sickness that prevailed amongst the men, had to be supplemented by additional supplies obtained from the local market. The cost of the former was Rs. 149-2-0 and of the latter Rs. 103-13-0.

Demarcation of gardens, &c.

12. The Deputy Commissioners of the districts which were to be operated on by the Lower Burma Field-to-Field Survey this year were addressed by the Director for the necessary demarcation of gardens, orchards, burial-grounds, roads, monasteries, pagoda, and school-lands and village-sites to be done in accordance with the boundary rules; but in no single instance was the work satisfactory. It was certainly worse than that of last year. A good deal of the demarcation work, therefore, had to be done at the time of survey by or under the immediate supervision of the camp officers, inspectors and field-surveyors. In Labutchan South circle of the Thôngwa district, and Thamandewa circle of the Bassein district, this demarcation work was altogether neglected. In the Thayetmyo district there was every excuse for the thugyis, who are, as the Deputy Commissioner correctly describes them, an ignorant lot.

13, 14, 15, and 16. * * * * *

Difficulties of survey and organization.

17. These were pretty much the same as those of last year and consisted in the work being situated in four different districts, the camps being so far away from each other, the amount of heavy jungle cutting that was necessary, the smallness of the average field, the loss of time that resulted from the frequent shifting of the camps from

one centre of work to another, the having to survey on the triangulation system instead of on ready-made plots, and, lastly, the intricate nature of the country operated in which was as difficult as it is the lot of any Revenue Survey party to be called upon to work in. In the circles of the Bassein district which border on the sea great hardship was experienced by the surveyors and their men for want of drinkable water, as the work in these parts was carried on after the villagers of the localities who remain there for the fishing season only had left for their permanent homes higher north. The organizing of the party also took up a good deal of time and caused no inconsiderable amount of anxiety. A portion of the menial establishment was procured through agents from India, but the greater part was entertained locally. There were several desertions both of surveyors and khalassis in the field; but they were soon replaced by others who were got from various sources. Six of the surveyors, however, had to be promoted from the tindal class, as a temporary measure, owing to the difficulty in getting all at once the requisite certificate-holders for employment on the work. The Camp Officers being Burmans the entire correspondence had to be carried on through the medium of the vernacular. In the matter of accounts a great deal of work devolved upon the headquarters office.

Outturn of work and proportion of cultivation to waste.

18. The total area completed comprises 1,565·60 square miles, divided for each of the camps as follows:

For Camp No. 1 ...	In Prome	= 367·41	=690·68 square miles.
	In Thayetmyo	= 323·27	
For Camp No. 2 ...	In Thôngwa	= 267·91	=866·00 square miles.
	In Bassein	= 598·09	
For Camp No. 3 ...	In Thayetmyo	= 8·92	...=8·96 square miles.

Considering the various difficulties and drawbacks before enumerated, the area done by Camp No. 2 is as much as could have been fairly expected from it. It would have been even better but for the amount of work that had to be done over a second time. In Camp No. 1 the outturn ought to have been larger had the mistake about undertaking a portion of work on the triangulation system not been made. Camp No. 3, which is a traverse one, having completed its work proper for the season, undertook and successfully accomplished, in addition the area above given with five of its surveyors.

The proportion of cultivation to waste for the entire tract surveyed is as 1 : 4·53, and for each of the districts separately as follows, namely:—

In Prome, ...	as 1 : 15·24
In Thayetmyo, ...	as 1 : 3·01
In Thôngwa, ...	as 1 : 1·99
In Bassein	as 1 : 5·80

In the three last named districts the figures show that there was a considerable amount of cultivation for survey, but in Prome the same is not the case. There, however, the waste consists to a large extent of what is known there as "indaing," which is land that is fit for cultivation, and which, it was said, was soon likely to be taken up for that purpose.

19. * * * * *

Myoôks.

20. Maung San Dun was formerly in charge of the old Cadastral Camp No. 1 which was broken up at the end of last year. He was on privilege leave from the 7th September to the 31st October 1891. On his return from leave he was transferred in the capacity of Assistant Camp Officer to the newly formed Traverse Camp No. 3. During the last recess months he was instructed in the use of the theodolite and the observation and computation of azimuths, time, and the like. He worked very zealously and well while with Mr. Hardinge, when he did a large amount of main circuit work, observing for azimuth and partalling; he is a careful and accurate observer with the theodolite. His main circuit work lay through very heavy country, and while upon it both he and his men were subjected to much exposure to the weather, in consequence of which and of various privations to which they were put, all of them suffered considerably in health. His squad on one occasion even struck work, one-half of the men coming into camp and the others deserting altogether. Maung San Dun's services being required towards the end of the field-season in connection with the work of Cadastral Camp No. 1, he was transferred to it on the 20th April 1892, but did not assume formal charge of the work there till the 25th idem. Since his assumption of charge of Camp No. 1, the work in it progressed satisfactorily. The recess work too is now well in hand. Maung San Dun having passed the Departmental examinations in law by the lower standard and in revenue by the higher, and having otherwise deserved well, was confirmed in his appointment as Myoôk last May.

Maung Tun was in charge of Camp No. 2 which worked in the Thôngwa and Bassein districts. He completed the survey of a large area of country in the year under exceptional difficulties. He has worked with praiseworthy zeal, but was at first disposed to rely too much upon the honesty of his inspectors for good work, till pressure was brought to bear upon him with a view to his exacting better work from the men serving under him, when the quality of the work of his camp sensibly improved. Maung Tun successfully

passed the competitive examination for Myoôkships in December 1890. Since then he has passed the Departmental Examinations in law and revenue by the higher standard, and has now been confirmed in his appointment as Myoôk.

Maung Pyu Than held charge of Cadastral Camp No. 1 up to the end of May last, when it became necessary to remove him in consequence of his mismanagement of the work. It was due to an error of judgment on his part that the triangulation work on the Mindôn side, which had to be subsequenly rejected, was at all undertaken. He was also in a small measure responsible for the slight delay that occurred in completing the records relating to the Prome survey last recess. But his greatest fault lay in his inability to control his inspectors and field surveyors, and his neglecting to see that his subordinates performed their duties in a proper manner. Maung Pyu Than has not worked satisfactorily this season. His previous good work, however, entitled him to some consideration, which was shown to him, by his transfer, under the Director's orders, to the charge of the Map Section, with a loss of his personal allowance of Rs. 50 only. Maung Pyu Than, I am glad to report, is now doing well in charge of the Map Section. He has not yet been confirmed in his appointment as Myoôk.

Inspectors, field surveyors, &c.

21. There were eight inspectors in all. Of these only one of each camp can be said to have worked satisfactorily, while two others worked fairly well. In two instances, the inspectors' partal lines were found to have been fudged, and returns of work submitted by them false. In one case, the inspector had besides neglected to supervise the triangulation work upon which his field surveyors were put on the Mindôn side. For these faults he was reduced and transferred to the Map Section as a draughtsman. In the other case, the inspector had, in addition, been guilty of providing a cultivator with a trace of his holding, on payment, for which he was reduced a step and fined heavily besides. There appeared to be at first a want of proper supervision over the actions of the inspectors by the Camp Officers, owing to which indifferent work was being accepted from the field surveyors, and passed. Later on, however, when heavy fines were being imposed on the inspectors for their indifference and neglect in this respect, better work was forthcoming. The field surveyors seeing that their inspectors were willing to accept carelessly executed surveys were beginning to send in work of this stamp, till numerous sheets were returned for re-survey and fines imposed pretty generally upon them, when the proper quality of work was produced. In two cases it was found that the field surveyors had copied in the boundaries of the kwins on their sheets from the work of the field surveyors of the adjoining kwins, instead of surveying them independently themselves. A good deal of this laxness was attributable to the fact of several of the inspectors, surveyors, and others having, contrary to standing orders, taken their families out with them into the field or secured new ones for themselves while there; but on its becoming known that such was the case the practice was immediately put a stop to. The Myoôks were only able to visit an inspector's division on an average once in the month. The amount of fines inflicted on inspectors for various faults was Rs. 236-5-8 and on field surveyors Rs. 865. These punishments had the desired effect, and good reliable work was afterwards done all round. There were several resignations, removals (including one death), and desertions during the year as will be apparent from the fact that 128 field surveyors were entertained from time to time, while 96 is the average number who worked throughout the field-season's term. One of the reasons why surveyors were so ready to desert their posts in the field on the slightest provocation was that they could so easily get employment in survey and other offices elsewhere. A representation on the subject was accordingly made, when a circular was issued by the Director prohibiting the employment of such men in provincial offices where a knowledge of surveying was a requisite qualification for a candidate unless certain specific conditions were fulfilled. Since then there has not been that tendency for desertion on the part of the field-surveyor which was evinced by him before.

* * * * *

Cost of operations.

22. The total cost of the work, exclusive of that for holding-marking, preparation of maps and registers for Supplementary Survey offices, revision surveys, and the drawing and preparation of the 16 and 2-inch maps for lithography, for the entire survey year (1st December 1891 to 30th November 1892) amounts to Rs. 91,078-15-2. This includes the actual expenditure incurred during the field season together with the amount of the sanctioned estimates for the current recess. The cost rate for the work executed during the year amounts to Rs. 58 per square mile or Re. 0-1-5 per acre against Rs. 67 per square mile of the year before. This low rate is due chiefly to the fact that there was not the same initial expenditure in the equipment of the camps as had to be incurred in the previous year. And when it is considered that the work has been done by Burmans,—who are, as a rule, paid better wages than the natives of India,—that the areas operated on were scattered in four different districts, and that the country was of a most difficult character for survey, it is hoped that the results achieved will be considered to be of a satisfactory nature.

Holding-marking.

23. The work of holding-marking was completed in the entire area, of which the survey was accepted as good. Eight holding-markers and a similar number of tracers were employed for this. The

number of holdings delineated on the traces was 39,302, with an area of 178,164 acres. This gives the average size of the holding at 4·53 acres, being 2 acres in Prome and Thayetmyo and 14 and 22 acres respectively in Thôngwa and Bassein. The cost of the work comes to Rs. 3,915-7-11. This is higher than last year's cost, and is due to each of the holding-markers being allowed two khalassis in the year, which they had not previously; although, as a matter of fact, these men were given to them before from wherever they could be made available. This establishment is found to be necessary for the minor revisions of survey work, which the holding-markers have to perform in addition to their other duties. The number of holdings of which the holding-marking was tested by Inspecting Officers was 6,043, or about one-sixth of the total number. In one inspector's division in the Bassein district the work was not found to be very good, and had frequently to be re-done, but in the other divisions the work was satisfactory. It is a matter of surprise that the holding-marking work has proved to be as good as it has considering that the holding-marker has frequently to depend upon the statements of a few villagers for the marking in of the holdings relating to an entire kwin, as owners and occupiers of the land often fail to accompany him while he is engaged on the delineation of the holdings on his trace. In the Bassein side in particular the holding-markers complained that many of the owners would not turn out to point out their lands. The Camp Officer reported the matter verbally to the Township Officer of Labutta, but matters in no way improved. In the matter of the checking performed by the inspectors, it is found that they are unable to do very much without detriment to their work proper, as the holding-marking is generally undertaken in kwins long after the survey in them has been completed, and the inspectors in all probability left the localities for other centres. For this reason it has been decided to provide a special inspector next year for the purpose of checking and generally looking after the holding-marking work in each of the Cadastral camps of the party.

Revision surveys.

24. These were undertaken in the Prome and Hanthawaddy districts in consequence of its being pointed out that the maps relating to certain kwins, which were published last year and the year before, were found to differ in some respects from the true aspect of the land. In two out of the three cases of Prome, the maps were on examination found to be correct; in the third there was an omission from survey of 64 garden holdings, situated inside of heavy jungle, and which being of a more or less temporary character, undemarcated, and declared by the thugyi of the circle to be abandoned holdings and paying no revenue to Government, were omitted from survey at the special request of the thugyi by the field-surveyor originally employed on the work. In the three cases of Hanthawaddy, the country is low-lying and subject to annual floods, in consequence of which field boundaries are constantly altered in position to suit the new requirements of the land. Fresh surveys have been made, and the maps of these will be reprinted shortly. The cost for these revisions comes to Rs. 293-11-3.

Increase in area and revenue due to present survey.

25. The increase in area under assessment of the work of the Local Agency Survey over the thugyis' measurements comes to 76,877 acres, with a revenue demand exclusive of the 10 per cent. cess of Rs. 1,28,733, against similar increases last year and the year before of 16,000 acres and 47,658 acres and Rs. 25,000 and Rs. 81,950 respectively. The figures of this year's local survey work have been contrasted, except for Prome and Bassein, with the thugyis' figures of 1890-91, as it was again discovered that many of the thugyis concerned had been arbitrarily raising their areas in order to assimilate them as much as possible with the survey areas. In the case of Prome the thugyis' figures for 1891-92 have for the purposes of comparison been accepted, as there does not seem to be any material change in them during the past three years, while for Bassein the thugyis' figures for 1889-90 have been taken, as it was during that year that the excessive arbitrary increases had been made manifest, especially for Thamandewa circle. The percentages of increase in area and corresponding revenue over the thugyis' figures for the years above referred to, together with the figures upon which these calculations are based, are for each district as follows, namely:—

District.	Year for which thugyis' figures have been accepted.	Area.			Revenue, exclusive of cess.			Percentage of increase.	
		According to survey.	According to thugyis.	Increase.	Calculated on survey area.	Calculated on thugyi's area.	Increase.	In area.	In revenue, exclusive of cess.
		Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Acres.	Rs.
Prome	1891-92	14,319	12,692	1,627	8,538	7,063	1,475	12·82	20·88
Thayetmyo	1890-91	52,817	31,084	21,733	62,528	36,189	26,339	69·92	72·78
Thôngwa	1890-91	57,097	30,932	26,165	1,22,246	66,073	56,173	84·59	85·02
Bassein	1889-90	53,032	26,880	27,352	87,164	42,718	44,746	102·90	104·75
Total ...	...	178,165	101,288	76,877	2,80,776	1,52,043	1,28,733	75·90	84·67

From the above it will be seen that the areas as revealed by survey are considerably in excess of the thugyis' areas. In Prome, although there was a large tract of country surveyed, the cultivated area therein was disproportionately small. The average prevailing revenue rate on land, for the tracts surveyed in the year, is Re. 1·58 per acre, being Re. 0·60 in Prome, Re. 1·18 in Thayetmyo, Rs. 2·14 in Thôngwa, and Re. 1·62 in Bassein.

26. * * * * *

Lithography and publication of maps.

27. The lithographing of the maps is done in the Government Press at Rangoon, the preparation of the sheets on the lithographic paper being executed in the Field-to-field Survey office; 25 copies of each 16-inch sheet are published and 200 copies of each of the 2-inch. Of the former it is the practice to forward 22 copies immediately on publication to the Deputy Commissioners concerned, three being retained in this office, one for use by Camp Officers, and two for record, one being bound in book form and the other kept in its loose state. Of the 2-inch sheets, 100 copies are intended for the Deputy Commissioners to whose districts they refer, three for retention in this office, one for the Survey of India Department, Calcutta, for incorporation in their standard sheets, and the remainder for sale at the Government Book Depôt, Rangoon. These maps will be distributed as soon as published. Most of the sheets have been left incomplete so far owing to the survey work that has to be introduced on them, having being done yearly bit by bit up to now. There are 1,970 of the 16-inch sheets relating to this year's work which are to be lithographed and 60 corresponding 2-inch sheets. The cost rate of the former is fixed by the Superintendent of Government Printing at Rs. 7 per sheet and of the latter at Rs. 11. The cost of the Map Section of the office for this year, actual and estimated, amounts to Rs. 8,310-14-1, which will give the cost per 16-inch sheet at Rs. 4-3-0 and of each 2-inch sheet at Rs. 6-10-0. The combined cost of these maps, therefore, will come to Rs. 11-3-0 per 16-inch sheet and Rs. 17-10-0 per 2-inch sheet, which is less than that arrived at last year. The 16-inch publications last year had, through the inability of the Stationery Office at Calcutta to comply with the demands of the Superintendent of Government Printing here for the requisite kind of paper, to be done on the ordinary white machine-made paper, and as a consequence the lithographic work was not as good as it should have been, the lines having smudged in many instances and the impressions came out more brown than black. The paper too was not strong and would therefore not stand the wear and tear to which it would be exposed in supplementary survey offices. A large supply of the proper kind of paper, namely, the thin, white, hand-made has now been received, so that the past year's experience, in regard to the lithographic work, will not be repeated this year.

28. * * * * *

Fines realized.

29. The total amount of the fines imposed upon the inspectors, field-surveyors, and others of the Cadastral Section of the party amounts to Rs. 1,346-9-4, which sum has been duly credited to Government.

30. * * * * *

Partalling.

31. The extent of partalling of field-work of the surveyors, which was executed by Inspecting Officers during the season, amounted to 990 linear miles, of which 838 miles was done by the inspectors. For the purpose of these partals 25 miles of line-cutting through jungle had to be done; Check lines were run in 755 kwins, including 10 of which the work has yet to be re-done in 40 kwins no partals were taken for want of the necessary time, but these relate to entire jungle or water areas. It is the practice to run at least one main partal line right across the face of a kwin, and one or more minor partal lines on each sheet. The Myoôk partalled 189 kwins (28 of which were not checked by the inspectors) and the Superintendent 45. The field work of Camp No. 2 was tested by the Director in four kwins of the Thôngwa district. The partalling of the inspectors was in two cases not thorough, but in the others it was, on the whole, satisfactory. There was a proneness on the part of two of the inspectors at least to plot their work from their field books some days after the partals in kwins still under survey had been made, thus giving the field surveyors, to whom the sheets used to be at once returned, opportunities of rectifying any errors of work during the interval. Such carelessness in checking was on discovery immediately put a stop to. The survey work as the result of the checking that was altogether performed, had to be redone in respect to 50 kwins in their entirety, exclusive of 10 kwins which have to be surveyed afresh next year, and to 48 kwins in part only. The survey work of the kwins of which the maps have been finally accepted is good. The experience of the past season has shown that an inspector cannot do full justice to the work for which he is responsible where he has such a large charge as 12 field surveyors under him; next season this number will be reduced by two for each of the inspector's divisions.

Accounts and periodical reports.

32. The system in force last year of drawing moneys for the working expenses of the party on abstract bills as needed, and submitting detailed bills in the usual forms to the Comptroller at the end of each month, was adopted this year also and worked satisfactorily. During the field-season moneys were remitted to the Camp Officers on such treasuries as they required them by means of abstract bills drawn in their favour.

In this way the officers were kept in funds, and in no way inconvenienced for want of money, except on two occasions, when the Myaungmya treasury refused to cash bills presented to it, regarding which matter there was a deal of correspondence and consequent delay, and again at Rangoon when the treasury here adopted a similar course, and about which there was a like correspondence. These delays in payment were all the more to be regretted as due provision in the matter of the requisite moneys and the methods of procedure in regard to the drawing of them had been made long in advance. In the second case referred to there was a delay of so much as 1½ months before payment was made, in consequenee of which the Camp Offices were very much inconvenienced indeed, and in one instance at least a strike was feared amongst the men owing to their wages being due and unpaid for so long a period. The small unexpended balances of the moneys, which were made available at various district treasuries, were transferred to Rangoon at the close of the field-season. During the year the members of the party were placed on an equal footing with those of Settlement and Survey of India parties, in their being exempted from the operation of the rule under which a daily allowance may not be drawn for more than 10 days' halt at one place. Power to modify details of temporary establishments conferred on Settlement Officers in Burma has also now been extended to the Superintendent. This will facilitate work considerably. Throughout the field-season the district officers of the four districts worked in this year were furnished monthly with copies of the progress-reports relating to the field-work done in their respective districts. This was in accordance with orders.

Assistance rendered by local officials.

33. The assistance rendered by the local officials within whose jurisdictions the party worked this year was fairly good, except in three specific instances, which were duly reported to the Deputy Commissioners concerned. One was that of the Thugyi of the Yathit circle in the Prome district, who actively interfered in endeavouring to obstruct the progress of survey work by prohibiting the villagers of his circle from rendering all lawful assistance to the members of Camp No. 1. A second case was that of the Thugyi of Labutchan South circle of the Thôngwa district, who could never be got at by the Survey Officers, and who would do nothing to assist them; and the third was that of the Thugyi of Thamandewa circle of the Bassein district, who not only would not render any help to the Survey officials, but who also forbade the people of the place to renders such help. In the Kyôntôn circle of the Thôngwa district, also, the villagers of the place would not assist the Surveyors to find the old survey marks, and much time was therefore lost by the Surveyors in searching for the stations. The District Officers of the districts in which the party operated issued stringent orders at the commencement of the field-season for all necessary help to the given to be members of the Survey, and these were followed by others much to the same purpose. Copies of such orders were furnished to the Camp Officers, who provided copies of these again to their inspectors and surveyors

34. * * * * *

TRAVERSE SECTION.

Preliminary arrangements.

35. Owing to the transfer of No. 12 Party to Upper Burma it was decided according to the Survey Programme of 1891 and subsequent orders, that the areas that were fit for survey, and which so far had not been mapped, in the districts of Prome, Bassein, Thôngwa, Thayetmyo, Kyaukpyu, and Sandoway, were to be both traversed and surveyed in detail by the Local Agency Party. The area of this work roughly amounted to 3,000 square miles, which it was considered would fully occupy the party for a space of two years. In this view early arrangements were made for the securing of the necessary staff for the traverse portion of the work, for the training of the required number of hands in the office, procuring of the requisite supply of instruments and other material, and the like. The necessary forms and tables that would be needed for this particular work were also prepared in bi-glot, and a complete set of instructions in English and Burmese, written for both the Cadastral as well as the Traverse sections with the object of securing a uniform and methodical system of work in the party. Much difficulty was not anticipated in the completing of the Cadastral camps, although it was known that they would have to be drawn upon to a great extent for the formation of the Traverse camps. Communication was accordingly opened out in all directions, both in India and Burma, and a supply of the hands that would be needed for the work generally settled about. In regard to the menial establishments that would be required, owing to the larger requirements of the party and the certainty that all the men could not be got in Burma, arrangements were also entered into for getting part of the required number from India. The Agents of the British India Steam Navigation Company, Limited, were also addressed in the matter of the conveyance of the men of the party to and fro between Calcutta and Rangoon, and the Local Party got to be placed on the same footing as Survey of India parties in regard to reduced passage rates. Then in regard to the officers that would be required for the work, there was no objection to having Burmans as the Assistant Camp Officers, but for the Camp Officers it was essential for the undertaking to be successful to have Europeans as such, and I laid great stress upon this. It was certain that one of the Traverse camps could

be taken charge of by Mr. Hardinge of the office, who had already familiarized himself with the Traverse methods; and as there was no other local officer available for the charge of the other Traverse camp, recommendations in the matter were made and the services of Mr. Haddock of the Survey of India Department secured for the purpose Mr. Haddock was accordingly seconded for service under the orders of the Government of India for employment in the Land Records Department of the province on the same conditions that applied to Messrs Torrens and Beechey, and joined the office in the latter end of October.

* * * * *

Training of hands.

36. During the recess months a theodolite class was opened out with the object of training the requisite number of sub-surveyors locally. The more intelligent members of the office were permitted to join this class, from whom the subsequent staff was to be chosen. The class was composed of 35 students and was regularly taught every day (including Sundays), both indoors and out of doors, for the space of over two months. Mr. Hardinge materially assisted in this work. The future Assistant Camp Officers and a dozen others who displayed some aptitude for the work, were besides instructed in the methods of observing the stars and sun, for azimuth, time, &c., and in the computations connected therewith. Of the two Traverse camps formed, Mr. Hardinge was placed in charge of one, No. 3, with Myoôk Maung San Dun as his assistant, and Mr. Haddock in charge of the other, No. 4, with Myoôk Maung Tha Byaw for assistant. Besides the four officers named, there were 2 clerks, 4 draughtsmen, 12 computors, 24 sub-surveyors, and 454 menials who went to compose the establishments. The superior appointments were held by 28 Burmans and Karens and 14 Hindustanis, that is, in the proportion of 2 of the former to 1 of the latter. Of the Hindustanis 11 were sub-surveyors, of whom nine were engaged from Upper India and two trained locally, while three were computors. These men had some previous knowledge of traverse work, but had to be taught their duties here besides. The object of procuring a few of this class was to establish a healthy competition between them and the Burmans. The success of the measure depended to a great extent upon the tact and management of the Camp Officers and was with their help completely secured. Much of the training and final polishing up of the sub-surveyors and computors was done in the earlier part of the field season by Messrs. Haddock and Hardinge, and it is to their continued exertions in the matter in the face of many difficulties that the work proved to be as successful as it did.

37. * * * * *

Taking the field.

38. Camp No. 3 left Rangoon for Kama in the Thayetmyo district on the 3rd November 1891, and Camp No. 4 for Kyunpyathat, in the Thôngwa district, on the 11th idem. They reached their respective destinations two days after the dates mentioned. Camp No. 3 was in charge of Mr. Hardinge and Camp No. 4 in charge of Mr Haddock.

System of payments to sub-surveyors and others.

39. Sub-surveyors received fixed monthly salaries of Rs. 40 to Rs. 60 per mensem; their railway and steamer fares to and fro for those who were engaged outside of Rangoon being also paid. Those of the deserving sub-surveyors who desired to continue in service during the recess months were taken on temporarily for work in the Cadastral section; the remainder were provided with leave-pay certificates, enabling them to visit their homes, and which required them to be present at Rangoon for next year's field work by the end of October. The computors and others of the superior staff are kept on for work throughout the year; these got pay varying from Rs. 30 to Rs. 50 per mensem, together with the usual travelling allowance while out in the field. The scale of remuneration for the menial establishment was the same as that fixed for the Cadastral section.

Commencement of field-work.

40. Immediately after the arrival of the camps at their respective centres of work, field-work was started. Camp No. 3 began its kwin traversing in the riverine circles of the Kama township which were completed by the end of February. The kwins in the best cultivated circles of the Myèdè and Thayet subdivisions were next taken in hand and completed before the end of the field-season. In addition to the above work a portion of the Thayetmyaung circle of the Prome district, which was left unfinished by No. 12 Party, was also traversed. This camp remained at Kama throughout the field-season, as the place was centrally situated for the proper supervision of the work, and there were facilities of communication from there with all the outlying places, which there would not have been from any other centre. It came into Rangoon on the 29th May 1892, after having closed field operations on the 26th of the same month. Camp No 4 operated in the Thôngwa and Bassein districts. It first took up the traversing of Kyunpyathat and Labutchan South circles in Thôngwa, which were finished by the middle of January, when the camp was shifted to Labutta, in the Bassein district, where it continued till the end of the field-season. The country in Thôngwa was still under water when the camp arrived there, but notwithstanding this the work was vigorously pushed on with from the very onset. In the Bassein district the balance of work that was originally sketched out for survey by No. 12 Party was taken in hand and finished. The camp stopped field-work on the 27th May 1892 and returned to Rangoon by special steamer on the 31st idem.

Supply of traverse plots.

41. Camp No. 3 supplied, in the season, 752 sheets appartaining to 295 kwins to Cadastral Camp No. 1. The supplies commenced being sent in from the middle of February, although this could have been done earlier if the Cadastral Camp had needed them, and were regularly kept up to the end of the field-season. Camp No. 4 also supplied 995 sheets relating to 400 kwins, in addition to 205 sheets relating to 71 kwins of Kyôntôn circle, which it plotted from the data obtained from No. 7 Party, and furnished to Cadastral Camp No. 2 to start the detail work with on the 2nd December 1891. The Cadastral Camp having completed the work in Kyôntôn circle in the space of a month and-a-half, was soon on the heels of Camp No. 4 at Kyunpyathat. Here, the latter was by this time able to supply a sufficient number of sheets to keep the former employed for another month; 201 sheets being thus given from time to time. At last, however, the Traverse Camp was caught up, and unable to keep the Cadastral Camp in sheets for a time, owing to which the Thamandewa circle was taken up for survey on the triangulation system. The reason for this short supply of sheets at this time was that the Traverse Camp started operations only in the middle of November, the country in the earlier part of the season was under water, the weather too continued unfavourable for some time, the line-clearing entailed much labour, and lastly the surveyors and their establishments were new to their duties, both their angular and linear measurements having had to be frequently re-done, and this may be judged from the fact that only 136 square miles of kwin traverses were completed in the first two months. Traverse work was, however, pushed on with vigorously on the Bassein side, and by the time the Cadastral Camp arrived at Labutta, within a month of the above time, plots in sufficient numbers were supplied, off and on, which kept the detailed work going right up to the end of the field term.

Enclosing of work surveyed on the triangulation system.

42. For the reasons given in the preceding paragraph, it became necessary for Cadastral Camp No. 2 to survey a portion of the country on the triangulation system. The area thus surveyed was situated in the Bassein district and consisted of 91·13 square miles which were enclosed by kwin traverses in the usual way towards the end of the field-season. In order that the stations laid down by the field-surveyors might be picked up as much as possible by the sub-surveyors who followed, so that the detailed work would not be disjointed, and would at the same time be capable of being accurately fitted on to the traverse sheets which were to be subsequently furnished, steps were taken to have traces, on tracing paper, prepared of the kwins, as soon as they were surveyed, and supplied to the sub-surveyors who were to be employed on the traverse work. These traces showed the boundaries of kwins, limits of cultivation, principal topographical features, and all the stations that had been laid down and which it was intended should be connected by the sub-surveyors in the course of their work; together with the names of kwins, creeks, villages, and the like which would in any way assist the sub-surveyors in readily identifying the positions of the field-surveyors' marks on the ground. They formed good indices to the work and helped the sub-surveyors in the way that it was desired to help them.

Tracts surveyed this year and those remaining for survey.

43. The tracts surveyed in traverse during the year comprise a total area of 1,587·44 square miles, of which, however, 310·24 square miles was not set up or plotted owing to the blocks thus omitted containing nothing but jungle which it would have been a simple waste of money to have surveyed in detail, especially as there was no immediate prospect of such land being taken up for purposes of cultivation. The areas surveyed during the year and those for survey or revision next year (see Map B) are given for each of the districts to which they have reference below, namely:—

District.	Total area surveyed during year.	Surveyed area of which kwin plots were prepared.	Area for revision in 1892-93.	Area for traverse in 1892-93.
	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.
Thayetmyo	747·24	537·00	...	...
Prome	8·92	8·92	...	...
Thôngwa	136·05	136·05	...	...
Bassein	695·23	595·23	10·00	...
Kyaukpyu	...	...	...	900·00
Sandoway	...	...	...	400·00
Total ...	1,587·44	1,277·20	10·00	1,300·00

44. * * * * *

Health of detachments.

45. At the commencement of the season sickness was prevalent to a great extent amongst the men, but with careful treatment and nursing casualties were prevented. The more serious cases had to be sent to the nearest hospitals for treatment; but in many instances these patients are reported to have deserted shortly after their admission there. As the hot season advanced better health was kept by the men generally, although in Camp No. 4 the deaths of five khalassis are recorded, two from cholera and three from dysentery. There were no deaths in Camp No. 3, which is a matter for congratulation. Had some of the men succumbed to the effects of the climate here, it is more than probable that there would have been wholesale desertions amongst the khalassis of the camp, owing to their being within comparatively easy reach of Rangoon. The value of the medicines that had to be purchased in the local market for the use of the sick, in addition to the supply obtained from the medical stores, was Rs. 77-5-0.

Demarcation of kwins and receipt of rough circle-maps.

46. The necessary instructions for the demarcation of kwin boundaries and the preparation of rough circle-maps, in respect to the tracts for survey during the year were issued by the Director to the Commissioners of the divisions in which such lands lay. In Prome and Bassein this demarcation had been previously done, so that the work had merely to be renewed where required, and no rough circle-maps were needed, although as a matter of fact Bassein did supply these. In Thayetmyo and Thôngwa the above work had to be performed in the circles for survey for the first time. In Bassein and Thôngwa most of the kwins had natural boundaries, and the demarcation work was well done. In Prome the old lines required opening out, and, as a rule, the work was found in a completed state; but in Thayetmyo the demarcation work was very defective, having at first been confined to actual cultivation only, and caused no end of trouble to the survey camp employed there. The maps, too, were mere enlargements of what already appeared in the published vernacular map of the district. All this was due, as the Deputy Commissioner correctly observed, to the thugyis being for the most part an ignorant and uneducated lot. With the prompt and ready assistance of the Deputy Commissioner in the matter, however, the tracts to be taken up by the survey were settled upon, the demarcation done, the maps got ready, and the survey work proceeded with shortly after the arrival of the camp at Kama. To Mr. Hardinge is due the credit of getting the proper description of demarcation done and maps prepared, with the help of the thugyis, whom the Deputy Commissioner kindly placed, for the time being, under Mr. Hardinge's orders, and also of his own surveyors. In a few instances, only, was it absolutely necessary for the surveyors to take their lines through gardens and standing crops, owing, in some cases, to the holdings not being demarcated, and in others, to their extending right up to the water's edge of a creek which formed the natural boundary to a kwin. Every care was, however, exercised in these cases to see that the lines were kept as narrow as the requirements of the survey permitted, and that as little damage as possible was done to the fruit trees, standing crops, and other similar obstructions.

Size of kwins.

47. The average size of the kwins traversed this year was 1·99 square miles. In Bassein several of the kwins were found to be as small as one-fourth of a square mile and under in area. Two or three of these, where they adjoined each other and were in other ways suited, were subsequently amalgamated and formed into one; but it is no easy matter to judge of the size of a kwin from a mere inspection of the demarcation maps, which are only rough sketches of the ground, and often drawn to no particular scale. The traversing of small kwins throws much extra work upon the survey. In Thayetmyo, the kwins are in many cases somewhat large, this is due to the surveyors, who did a considerable amount of the demarcation work themselves, having to depend for their boundaries upon those pointed out to them by the villagers, ywalugyis, and thugyis, whose ignorance generally in the matter was deplorable. Frequently a long narrow stretch of paddy-fields lying between two ranges of hills, or an immense piece of waste land was pointed out as a kwin; these were, however, as much as possible, cut up into convenient sized blocks and surveyed as such.

Permanent marking of survey stations.

48. All the theodolite stations were permanently marked by the usual pottery cylinders, with the exception of 125 stations, not being "tri-junctions" or "jawabs," which owing to the hilly nature of the country and the consequent short lines in places were not so marked. These stations belonged to the work in Thayetmyo; in 103 cases natural rocks were utilized for the purpose of the marks, and in 22 cases stout wooden pegs. Where clay pipes were employed, the imbedding was in almost all cases done before observation, but in the few exceptional instances, where circumstances did not allow of this, great care was taken to see that the pipes were put down at the correct points by entrusting the work to a trustworthy person only. The pipes that were required for the work of the year were procured through the kind offices of the Deputy Commissioners of Thayetmyo and Bassein. In the case of the pipes supplied at Labutta it was noticed that many of them had not been well baked, some that were stacked by the edge of the water having dissolved by the action of the fluid; to replace these, others had to be ordered The

number of pipes laid down for the purpose of permanently marking the positions of survey stations was 17,291. These were handed over at the time to the custody of the village headmen responsible for their preservation, and temporary receipts taken from them which were to be replaced afterwards by the final forms of notice prescribed by the Boundary Rules.

Preparation and srevice of notices to village headmen.

49. The number of final notices prepared in the usual form, in duplicate, with the skeleton kwin plots shown thereon on the 2-inch or 4-inch scale was 695. One copy of these notices is retained by the village headman and the other, after having been signed by him, has to be lodged in the Deputy Commissioner's office for record. In one instance the Deputy Commissioner at first refused to stamp the forms with his signature seal before they were filled up, but when it was pointed out that the practice had been in force for years in all the districts, including his own, in which revenue survey parties had worked, and that unless the signatures to the forms were affixed to them in advance, as asked for, the requisite service could not be effected by the Survey camps during the field season, and that the duty of doing so would otherwise afterwards devolve upon the Deputy Commissioner himself who would have to effect this service through the agency of the Land Records Department of his district, the necessary signatures were kindly given; besides, the instructions under the Boundary Rules provide for such signatures being obtained in advance. Service on the village headmen concerned was effected during the field-season for most of these; the balance of the forms will shortly be forwarded to the Deputy Commissioners of the districts to which the work relates for the necessary service upon the village headmen named in the notices. The total cost for pipe imbedding and the preparation and service of notices to village headmen came to Rs. 8,103.

Destruction to permanent survey marks.

50. The destruction to permanent survey station marks, within a short time of their being put down, occurred principally in the Thayetmyo district. The damage done was not confined to the pipes that had of necessity to be buried near roads and pathways, but also extended to those that were laid down in unfrequented places and in the heart of the jungle. Stringent orders were issued by the Deputy Commissioner and steps taken to prevent further destruction and punish wrong-doers, but detection in such matters is almost impossible, as the thugyis and village headmen who are responsible for the pipes can hardly be expected to watch over each individual station. Latterly, the necessary mounds of earth had been raised over and trenches dug round marks, which ought to serve as a protection to the pipes to some extent.

Duration of field season.

51. The field season consisted of six months, commencing 1st November 1891. It could not, however, be taken full advantage of in consequence of the unfavourable state of the weather both at its commencement but particularly towards its close; also owing to the delay of a few days that occurred at the onset, and which has been previously referred to, in the starting of the camps from Rangoon. The heavy showers of rain that fell from the middle of April up to the very end of May retarded the progress of field-work to a very considerable extent; in fact, were it not for this, the traverse work in Bassein would have been quite finished early in May, which would have enabled the Cadastral Camp that was working in the same district to have completed its work there too by the end of the field season.

52. * * * * *

Difficulties of survey and organization.

53. Owing to the difficult nature of the country operated in, especially so in Thayetmyo, where main circuits and even kwin traverses had to be taken over heavily wooded hills, coupled with the defective demarcation of kwin boundaries, sickness, the fact that most of the sub-surveyors were new to their work, and that the menial staff were untrained to their duties, traversing did not progress very well at first. In a couple of months, however, as the men became accustomed to the work, the outturn rapidly improved. Owing to the heavy jungle cutting that had to be done in all the districts operated in, the scarcity of food-supplies and in places the want of potable water, combined with the unhealthiness of the tracts worked in and the exposure to wind and weather that the men had to be subjected to, there were many desertions amongst the tindals and khalassis of both camps. In four instances the men struck work in a body, but with a deal of persuasion and a certain amount of pressure which was brought to bear they were got to return to their duties. The places of such men were filled by others entertained on the spot or got from Rangoon. The experiment was tried of inducing the Burman villagers to take service as khalassis, but with small success. To the ordinary Burman mind the idea of dragging chains, carrying loads, imbedding pipes, and line-clearing day after day under a burning sun seemed repugnant. The Burman sub-surveyors themselves did not appear to be anxious to have more than a couple of their fellow country-men in their squads, as they had to find them in food out of their own pockets, in addition to the pay that these men received from Government. There was a gread deal of reluctance on the part of the villagers and others concerned to point out the boundaries of kwins and circles to the sub-surveyors, more especially in the outlying tracts; this hindered the progress of the

work to some extent. The Hindustani surveyors were especially put to great trouble in this respect, as the Burmans evidently considered it *in fra dig* to dance attendance upon the "Kalas." Another cause which very materially retarded the progress of operations was the unusual amount of rain that fell both during November and December, but particularly in April and May. In regard to the difficulties experienced in the organizing of the camps, these have been considerable, but as they have already been touched upon in previous paragraphs are not repeated here.

Outturn of work.

54. The work in the districts operated on in the year was as difficult as any traverse work could well be; notwithstanding this and other drawbacks, the area accomplished in main and minor circuits, of which there were 23, was 1,587·44 square miles, and that of kwin traverses exclusive of the jungle kwins which were not set up and plotted, 1,277·20 square miles appertaining to 695 kwins. The number of sub-traverse lines run was 146, the total number of linear miles of chaining (double measurements done with chains of 66 feet and 100 feet length) being 2,568. The total number of stations at which the theodolite was set up amounted to 17,416, and the number of angles observed to 18,936. The number of miles of line cutting that had to be done through jungle was 1,827, which goes to show the nature of the ground over which the work was carried. The average distance between two consecutive stations was 10·85 chains, and the number of pipes imbedded per square mile was nine. The angular work was checked by star and sun observations for azimuth at 88 stations, and the linear work by connection with 13 Great Trigonometrical stations.

This year's recess work.

55. The work that has to be done during the current recess season consists of the finishing up of the various computations relating to the work done during the field-season, preparing of sundry abstracts of work, plotting of the 2-inch sheets, writing up the co-ordinate table books, arranging of several volumes relating to the traverses and field-books, compiling of numerous indexes, and the like. Only the computing staff has been retained for these duties, and they will have their time fully occupied in the work up to the end of October, when their next field-season commences. Advantage will be taken during the recess months to train extra hands in surveying with the theodolite, as also in computation work, so that there may be no paucity of hands when the time arrives for taking the field in the ensuing season.

Camp Officers and Assistants.

56. Mr. Hardinge was in charge of Traverse Camp No. 3. He has been indefatigable in training and perfecting as much as possible the staff of surveyors, computors, and others under him. Both during last recess and in the field he spared no time or pains in getting his men not only to understand their duties but likewise to perform them. At the start in particular when difficulties surrounded him on all sides in the entertainment of menial labour, in having a staff of men who were new to their duties, in finding on his arrival at his centre of work that the country had not yet been demarcated in the orthodox manner, and encircled as he seemed to be with nothing but hills and forests, he bravely faced them all when a more experienced officer would have been seriously discouraged at such an uninviting prospect before him Notwithstanding all this Mr. Hardinge succeeded in finishing, in proper time and with the best of results, both in regard to quality as well as to quantity the traverse of 756·16 square miles of country in the Thayetmyo and Prome districts, which were allotted to his camp for survey. In addition to this work he completed the cadastral survey, including the holding-marking, of an area of 8·92 square miles in Thayetmyo. It is due to Mr. Hardinge's personal influence over his men, his uniformly considerate care of them, his force of character and energetic work that such happy results have been achieved by his camp, and I have great pleasure therefore in bringing his name to special notice, with a view to some substantial mark of favour being shown to him. Mr. Hardinge had been previously recommended for promotion to the 2nd grade of Myoôks in addition to being confirmed in his present grade; but although the latter recommendation was given effect to, it was desired that the results of his work during the field season just past should be awaited before a recommendation for his promotion was made to Government. In addition to his having passed all the Departmental examinations by the lower standard, Mr. Hardinge has since also passed in Burmese by the higher standard. Under all the circumstances of the case, as above stated, I trust the time will now be considered to have arrived for the Government to mark its appreciation of Mr. Hardinge's continuous good work by promoting him in the way previously indicated.

Maung Shwe O is the present Assistant Camp Officer of Camp No. 3. On the breaking up of old Cadastral Camp No. 1, to which he was formerly attached, he was transferred to the charge of the Map Section. From here, on Myoôk Maung San Dun's transfer from Traverse Camp No. 3 to the charge of Cadastral Camp No. 1, Maung Shwe O was sent to replace him as Assistant to Mr. Hardinge. This was at the end of April last. Maung Shwe O has worked hard and well during the entire time he has been in this office. He has made himself familiar with his present duties and was employed for the short period of field-work that he did in Camp No. 3 on observing for azimuth, partalling, and supervising the cadastral work done by this Camp. Maung Shwe O is yet an Inspector. He was recommended some time ago for promotion as a Myoôk of the 5th grade, but as such appoint-

ments are intended only for Upper Burma, he did not get the step. He was subsequently recommended to be a Myoôk of the 4th grade, on his being put to his present duties, and I hope that this promotion may be given to him before long. There is budget provision for this, in addition to the reason that the appointment of Assistant Camp Officer, which carries with it certain important duties and responsibilities, is usually held by a Myoôk.

Mr. Haddock is a Survey of India Officer, who was seconded for service under the orders of the Government of India for employment under the local Administration. He joined the party towards the end of last October, and was placed in charge of Traverse Camp No. 4, the work of which he conducted throughout the season in a skilful as well as able manner. Mr. Haddock had numerous difficulties to contend with on his side also; his men were mere novices and had to be drilled into their work, the line cutting through jungle was heavy, the country was under water at the commencement of field work, rain and high winds prevailed in the early part of the season as well as for a long time before its close; there was a loss of 11 days before the field could be taken, the working term was cut short owing to the two previous causes, the assistance rendered by villagers and others concerned was not as satisfactory as might have been, portions of the country worked in were of an unhealthy nature, &c. As far as such obstacles could be overcome, they were, and a season's good work was done, an area of 136·05 square miles having been traversed in Thôngwa and 695·23 square miles in Bassein. An area of 10 square miles remains over for revision in Bassein, which the continuous and heavy rain that fell towards the end of the season would not permit of being completed this year. Mr. Haddock has exerted himself to the utmost in putting his work into shape, in training his field and office hands, and in getting out of them a maximum amount of good and reliable work. Mr. Haddock deserves much credit for his labours in this respect. He is a careful and able officer and understands his work thoroughly.

Maung Tha Byaw was the Assistant Camp Officer of Traverse Camp No. 4. He supervised the work of old Cadastral Camp No. 1 during Myoôk Maung San Dun's period of privilege leave, but did not do very well while in such charge. From here he was transferred, on its formation, to the Camp to which he is at present attached, where I am glad to be able to say he has acquitted himself in a satisfactory manner. Maung Tha Byaw has worked hard during the field season and his work has been found to be thoroughly good. He was engaged in the season chiefly on partalling, but also on main circuit work and in observing for azimuth, &c. He met with an accident in the field which nearly resulted in the loss of an arm. This necessitated his being kept on office work for the space of about a month while yet out in the field.

Sub-surveyors, computors, &c.

57. The sub-surveyors as a body worked well and showed themselves anxious to give satisfaction, although at the commencement of operations, owing to the newness of the men to their duties, a great deal of their work had to be re-done. There was a marked tendency at first on the part of surveyors and tindals to record their measurements in their field-books in pencil instead of doing so on the spot in ink; the former practice was open to grave objections, and after a time was got to be altogether discontinued. Five of the Burman surveyors and three of the Hindustanis did remarkably good work; in one instance in particular the quantity done was extraordinarily large, but owing to this very fact necessitated frequent revision. The daily average outturn per man in the season for working days and days on which they were idle taken together was of stations of observation four and of chaining (double measurements) 44 chains. The computation work in the Camp Offices was very heavy, and the computors without exception performed their duties in a most satisfactory manner. Four of the Burman computors and one Hindustani rendered excellent service, one of the former, belonging to Camp No. 4, was transferred to Ma-ubin, on promotion, as a Probationer of Land Records. All the draughtsmen did good work, one in particular being highly commended.

Cost of operations.

58. The entire cost of the traverse work, exclusive of that in connection with pipe-imbedding and the preparation and service of notices to village headmen, amounts to Rs. 74,073, which is made up of the actual expenditure of the seven months of the field-season taken with the full sanctioned allotment for the five months of the current recess. This gives the cost rate per square mile at Rs. 46. The cost shown would have been much less, but for the initial heavy expenditure in the equipment of the camps for the first time, in the boat-hire charges every month rendered necessary in a country so full of waterways as the southern portion of Thôngwa and Bassein, in the expenses of conveying camps from place to place, and also for the following causes which went to impede the progress of operations and thus enhance the cost of the work, namely, a good deal of revisionary work having to be undertaken in consequence of many of the sub-surveyors, who were new to their duties, submitting somewhat indifferent work at the start, the menial establishment being inexperienced in the work they had to perform, the line-clearing being considerable, the shortness of the working term, sickness, and lastly the unfavourable weather that was experienced at the commencement and for some time before the close of the field-season. Next year, if all goes well, when most of the drawbacks above enumerated will in every probability not

recur, even a lower rate of cost than that incurred this year may safely be looked forward to.

59, 60, and 61. * * * * *

Partalling.

62. The number of re-measurements that it was necessary to make, owing to the traverses not proving, was of angular work 4,759 angles and of linear work 964·28 miles. The amount of partalling thus done amounted to one-fourth of the total number of angles observed and to one-third of the total distances measured. This proportion is high, and was due to the sub-surveyors being disposed at first to send in indifferent and careless work which could not be accepted, to the chaining extending over steep hills and through dense jungle, and also to the desire that existed to keep the errors of working well within the percentages permissible for this class of survey.

Mathematical results.

63. The quality of the work done in the year was decidedly good as will be apparent on a reference to Statement **D**. The limit of error, in regard to the distances on the meridian and perpendicular, allowed, was one link in every 10 chains for kwin traverses and half a link for main circuits. In angular work it was one minute in every three and five angles respectively. If greater corrections than these were required in the computations, a re-survey became necessary; although practically errors of 50 per cent. over and above these limits would not have effected the quality of the work to any appreciable extent. As a matter of fact the higher percentages were adopted under certain circumstances, as the limits of error up to which the work could be passed; but the cases to which these applied were only a very few in number. The average angular error per station for the entire work was five seconds and the average error for 10 chains of distances 0·6 of a link.

64. * * * * *

Assistance rendered by local officials.

65. In the Thayetmyo district the Deputy Commissioner, who took a keen interest in the work in hand, issued stringent orders to the local officials and others concerned to give the Survey every help, even to the cutting of lines through jungle. As a consequence, the work progressed as satisfactorily as it did. In Prome there was only a small area for traverse, and the sub-surveyor sent to complete it got such assistance as he needed. In the Thôngwa and Bassein districts, however, the villagers and others notwithstanding the repeated orders issued in the matter by the Deputy Commissioners of these places, failed to afford much help to the Traverse Camp which was employed in these districts. The Lower Burma Field-to-field Survey being a Local Agency one, naturally looked more than the regular Survey of India parties would to local officials for help and co-operation; but in the cases referred to such assistance was not always forthcoming.

GENERAL.

Cost rate of combined operations of traverse and detail survey.

66. The cost of the combined work of the traverse and detail survey of the year amounts to Rs. 104 per square mile, or 2 annas 7 pies per acre. The rate per field for traversing, detail survey, and the preparation of maps, relating to the work done by Local Agency in the year, comes to 5 annas 11 pies.

Reasons for lowness of cost.

67. The chief reasons for the local survey being able to do its work so cheaply are that a considerable saving is effected in the comparatively small salaries, &c., of officers, the fact of interpreters not being employed, Hospital Assistants and heavy baggage not kept up, in camps not being conveyed to and fro between India and Burma, and so forth.

Advantage of one party being entrusted with the entire work (traverse and detail).

68. It is a decided advantage to have both the traverse and detail survey conducted by the same party, instead of by two,—one an Imperial and the other a Provincial. The reason for this is that whereas in the former case one set of officers can supervise both sections of the work, in the latter two sets become necessary, and the cost is thereby increased. Then, again, all possibility of friction between the sections is avoided by confining the work to persons of the same service, and this in itself is important.

69, 70, and 71. * * * *

Appendices.

72. There are attached to this report two index-maps, **A** and **B**, which respectively serve to show the tracts surveyed by Local Agency, Cadastrally, and in Traverse, up to date, and those for survey next year. Two statements, **C** and **D**, also form appendices to the report. These are abstracts of the various more important works performed in the year by the Cadastral and Traverse sections respectively of the party.

RANGOON:
The 4th July 1892.

J. C. CLANCEY,
On special duty under the Director of Land Records and Agriculture, Burma.

C.—*General Abstract of work performed by the Cadastral Section of the Lower Burma Field-to-field Survey by Local Agency Party during the year 1891-92.*

No. of camp.	District.	Number of kwin plots remaining over from field-season of 1890-91.	Number of kwin plots received during the recess-season of 1890-91 and the field-season of 1891-92 from No. 12 Party.	Number of kwin plots received during the field-season of 1891-92 from the Local Traverse Camps.	Number of fields surveyed.	Average size of fields surveyed.	Area of fields surveyed.	Area of topographical features surveyed.	Total area of all descriptions surveyed.	Amounts paid to field-surveyors according to contract rates of payment.	Number of miles of line-cutting done through jungle. By surveyors.	Number of miles of line-cutting done through jungle. By inspecting officers.	Number of linear chains of partailling executed by Inspecting Officers.	Number of inspectors employed.	Number of field-surveyors employed.	Number of holding-markers employed.	Number of kwins of which holdings were marked.	Number of holdings marked.	Average size of holdings.	Area according to survey (and of which the holdings were marked) of revenue-paying lands, including pottas.	Thugyis' areas for corresponding revenue paying lands, including pottas. For 1889-90.	For 1890-91.	For 1891-92.
						Acres.	Acres.	Acres.	Acres.	Rs. A. P.									Acres.	Acres.	Acres.	Acres.	Acres.
No. 1	Prome ...	12	168*	7	72,454	·20	14,482·37	220,659·78	235,142·15	10,961 9 10	1,253	69	35,257	4	48	4	165	6,844	2·09	14,318·88	12,958	13,765	12,692
	Thayetmyo...	...	...	283	159,604	·32	50,591·15	156,304·16	206,895·31								177	24,945	2·04	50,450·11	...	29,536	31,335
No. 3	Thayetmyo	...	...	5	4,487	·55	2,466·74	3,242·06	5,708·80	...	...	...	...	(1)	(5)	(2)	5	884	...	2,366·74	...	1,548	1,819
No. 2	Thôngwa ...	...	...	143†	70,129	·82	57,384·35	114,075·07	171,459·42	10,817 11 0	699	39	43,963	4	48	4	136	4,127	13·84	57,097·56	...	30,932	36,537
	Bassein ...	...	...	329	134,600	·42	56,301·41	326,480·18	382,781·59								284	2,502	21·55	53,931·67	26,580	30,490	30,185
	Headquarter's office	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Map Section ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	4	12	168	766	441,274	·41	181,226·02	820,761·25	1,001,987·27	21,779 4 10	1,952	108	79,220	8	96	8	767	39,302	4·53	178,164·96	39,538	106,271	112,568

* Those relating to 34 were received during the field-season.

† Those referring to 71 of Kyônton circle, were received at the commencement of the field-season.

C.—*General Abstract of work performed by the Cadastral Section of the Lower Burma Field-to-field Survey by Local Agency Party during the year 1891-92*—concluded.

No. of camp.	District.	Increase of survey areas over Thugyis' areas.			Revenue* calculated at current rates on the areas found by survey.	Revenue* calculated at current rates on the Thugyis' areas.			Increase in revenue* due to field-to-field survey.			Average prevailing revenue rate on land per acre.	Cost of operations to Government from 1st December 1891 to 30th November 1892. (That is, actuals up to 31st May 1892 with sanctioned estimates thereafter).						Remarks.
		As compared with Thugyis' figures for 1889-90.	As compared with Thugyis' figures for 1890-91.	As compared with Thugyis' figures for 1891-92.		For 1889-90.	For 1890-91.	For 1891-92.	As compared with Thugyis' figures for 1889-90.	As compared with Thugyis' figures for 1890-91.	As compared with Thugyis' figures for 1891-92.		Detail survey.	Holding-marking.	Preparation of supplementary survey maps, registers, area statements, &c.	Revision survey.	Maps (including lithograph work).	Total	
		Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
No. 1	Prome ...	1,360	554	1,627	8,538	7,254	7,745	7,063	1,286	794	1,475	0·60	38,498 10 2	2,137 13 4	1,440 0 0	173 11 3	1,800 0 0	44,050 2 9	
No. 1	Thayetmyo ...	...	21,733	19,663	60,161	...	34,641	35,346	...	26,339	25,363	1·18							
No. 3	Thayetmyo ...	...	...	...	2,367	...	1,548	1,819	...	...	...		814 0 0	40 0 0	...	...	...	854 0 0	
No. 2	Thôngwa ...	...	26,165	20,561	1,22,246	...	66,073	78,335	...	56,173	43,911	2·14	39,588 6 6	1,737 10 7	1,440 0 0	120 0 0	1,800 0 0	44,686 1 1	
No. 2	Bassein ...	27,352	23,442	23,746	87,464	42,718	48,540	48,136	44,746	38,923	39,328	1·62							
Headquarter's office		...	...	...	...	...	...	...	...	...	...	...	12,177 14 6	...	1,200 0 0	...	1,200 0 0	14,577 14 6	
Map Section ...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3,510 14 1	3,510 14 1	
Total...	4	28,712	71,894	65,597	2,80,776	49,970	158,547	1,70,699	46,032	1,22,229	1,10,077	1·58	91,078 15 2	3,915 7 11	4,080 0 0	293 11 3	8,310 14 1	1,07,679 0 5	

Exclusive of the 10 per cent. cess

D.—*General abstract of work performed by the Traverse Section of the Lower Burma Field-to-field Survey by Local Agency Party during the year 1891-92.*

No. of camp.	District.	Main and minor circuits surveyed and proved.		Kwin traverses surveyed and proved.		Number of sub-traverses run.	Number of stations at which theodolite was set up.	Number of angles observed.	Number of linear miles of chaining (double measurements) done.	Number of miles of line-cutting done through jungle.	Number of azimuths observed and computed.	Number of G. T. S. connections made.	Number of subtense-pole observations made and computed.	Number of 16-inch plots got ready and forwarded to Cadastral camps.		Number of latitudes computed.	Number of time observations made and worked out.	Number of angles partialed.	Number of linear miles of distance partialed.	Number of 2-inch quarter sheets graticuled and plotted for Map Section.	Number of books of co-ordinate tables (by circles) prepared for Cadastral camps.	Mathematical results of the traverses.		Number of sub-surveyors employed.	Number of computors employed.	Permanent survey marks		Cost of operations to Government from 1st November 1891 to 31st October 1892 (that is, actuals up to 31st May 1892 with sanctioned estimates thereafter.)		
		Number.	Area in square miles.	Number.	Area in square miles.									Kwins.	Sheets.							Average angular error per station, in seconds.	Average error per 1,000 links, in links.			Number of pipes imbedded and handed over to charge of village headmen.	Number of final notices prepared and issued to village headmen.	Traversing.	Pipe-imbedding (including preparation of notices to village headmen).	Total.
																												Rs. A. P.	Rs. A. P.	Rs. A. P.
No. 3	Prome	...	8·92	7	8·92	3	280	294	20·12	20·12	...	...	...	7	15	...	...	...	...	1	1	2	0·8	12	6	280	7	31,139 6 0	2,620 0 0	33,759 6 0
	Thayetmyo	8	747·24	288	537·00*	72	6,054	7,538	1,084·91	973·51	38	10	13	288	737	2	9	1,059	514·28	25	27	4	0·8			6,829	288			
No. 4	Thôngwa	4	136·05	71	136·05	25	2,075	2,267	298·29	150·00	10	...	...	71	201	...	...	700	100·00	5	2	5	0·5	12	8	2,075	71	35,638 13 6	2,520 0 0	38,158 13 6
	Thôngwa	...	...	...	...	...	...	...	...	...	...	...	...	71†	205†	...	...	...	...	8	1	...	...			...	...			
	Bassein	11	695·23	329	595·23‡	46	8,107	8,837	1,165·00	683·49	40	3	6	329	794	1	1	3,000	350·00	22	11	5	0·5			8,107	329			
	Headquarter's office.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7,294 12 6	2,963 0 0	10,257 12 6
Total ...	4	23	1,587·44	695	1,277·20§	146	17,416	18,936	2,568·32	1,827·12	88	13	19	766	1,952	3	10	4,759	964·28	61	42	5	0·6	24	14	17,291	695	74,073 0 0	8,103 0 0	82,176 0 0

* Exclusive of 210·24 square miles of jungle kwins not set up and plotted. † Surveyed by No. 7 Party, Survey of India. ‡ Exclusive of 100·00 square miles of jungle kwins not set up and plotted. § Exclusive of 310·24 square miles of jungle kwins not set up and plotted.

G. B. C. P. O.—No. 5665, D., L. R. & A., 17-10-92—300.

A.

INDEX MAP

OF

LOWER BURMA

SHOWING

Tracts of country surveyed-to-field by local agency in 1891-92.

Area surveyed on plot Local Traverse Camps.....

Do. Do. No. 12 Party, S. of I.....

Do. on irrigation system.....

Area left to be survey on plots of Local Traverse Camps.....

Do. Do. No. 12 Party, S. of I.....

Area for for survey quote of Local Traverse Camp in 1892-93.....

Area surveyed in 1892.....

Do. 1891.....

Jungle blocks ended from area originally sketched out for survey on the 16" sh.....

Tracts originally ended for survey by L. A., but subsequently made over to No. Party, S. of I.....

NOTE.—The colours for Kyaukpyu and Sandoway is only approximate as particulars relating to the tracts for survey are yet wanting.

B.

INDEX MAP

OF

LOWER BURMA

SHOWING

Tracts of country surveyed in traverse by Local Agency during 1891-92.

Scale, 1 Inch = 32 Miles.

Kwin traverses inside of Main Circuits.

Jungle blocks inside of Main Circuits, omitted.

Kwin traverses outside of Main Circuits.

Kwin areas to be revised or surveyed in 1892-93.

Kwins surveyed by No. 7 Party, S. of I., but of which plots were furnished by Local Traverse Camp.

Area for survey by Local Traverse Camps in 1892-93.

NOTE.—The colouring for Kyaukpyu and Sandoway is only approximate as particulars relating to the tracts for survey are yet wanting.

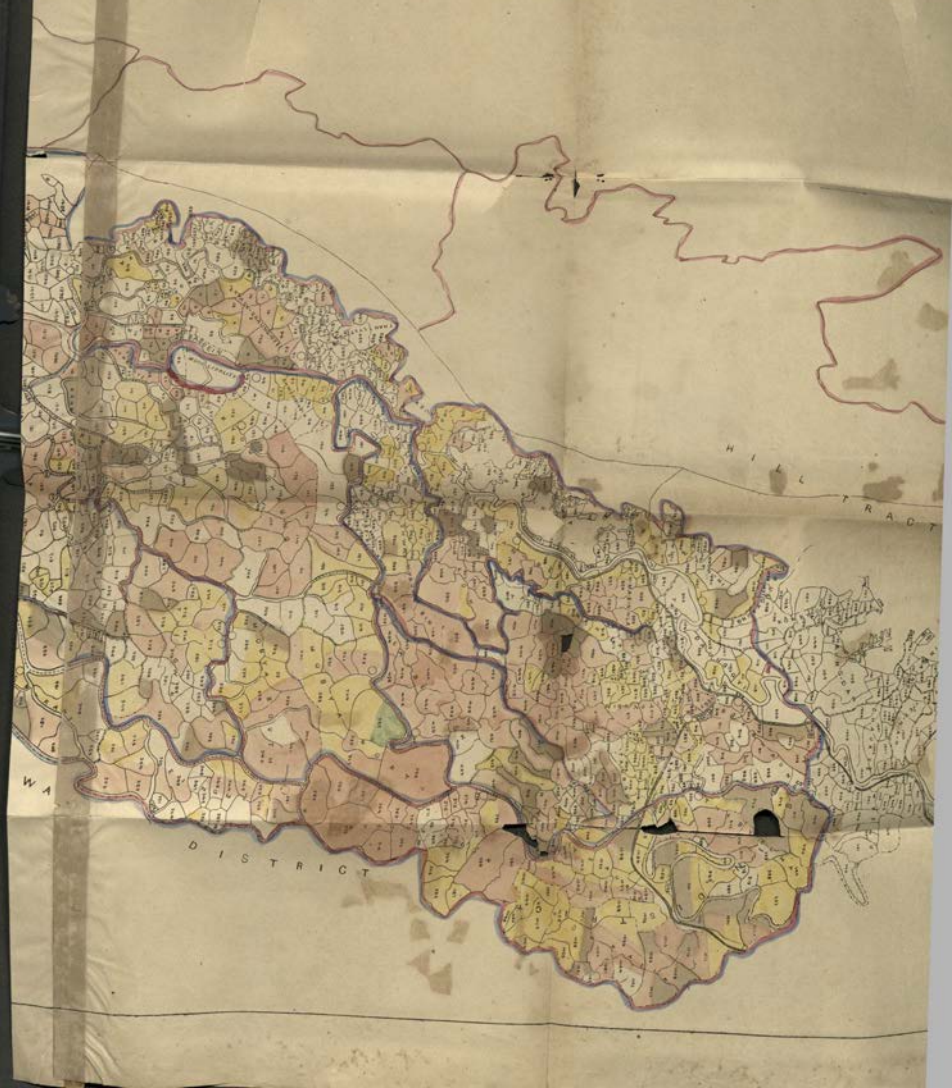
PART OF UPPER BURMA SHOWING PROGRESS OF SURVEYS, 1891-92

Index Map
AKYAB DISTRICT.
SHOWING
THE KWINS IN WHICH SUPPLEMENTARY SURVEY WORK
WAS TESTED BY INSPECTORS DURING 1891-92
AND TWO PRECEDING YEARS.

REFERENCES.
Kwins tested in 1889-90
Do. 1890-91
Do. 1891-92
Inspectors' divisions
Circle boundaries
Thugyis' headquarters
REFERENCES.
Township
Circle
Kwin
Settled tracts
HUNTER'S BAY
MAUNG THA DO PYU
Superintendent of Land Records, Akyab.

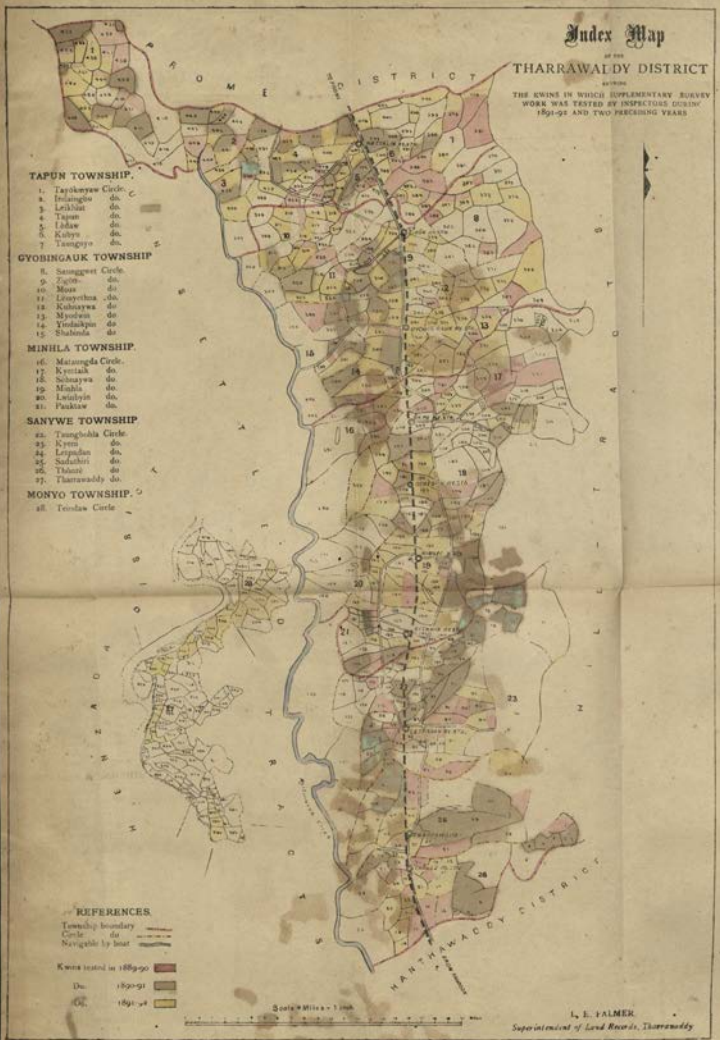
INDEX MAP
OF THE
PROME DISTRICT
Showing the kwins in which supplementary survey work was tested by Inspectors during 1891-92 and two preceding years.
Scale 4 Miles = 1 Inch.
Miles
THAYETMYO DISTRICT
TOUNGHOO DISTRICT
THARRAWADDY DISTRICT
KYAUKSE DISTRICT
REFERENCES.
Kwins tested in 1889-90
Ditto 1890-91
Ditto 1891-92
MAUNG SHWE GYOK,
Superintendent of Land Records, Prome.
1-6-92.

Map
OF THE
BASSEIN DISTRICT.
SHOWING
THE KHUNS IN WHICH SUPPLEMENTARY SURVEY WORK WAS TESTED BY INSPECTORS DURING 1891-92 AND TWO PRECEDING YEARS.
SCALE—4 MILES = 1 INCH.
REFERENCES.
Khuns tested in 1889-90
Do. 1890-91
Do. 1891-92
Tsugyis' circle boundaries and headquarters
Inspectors' divisions and headquarters
P. BEECHEY,
Superintendent of Land Records, Bassein


HILL TRACT
DISTRICT

BASSEIN RIVER
HILL TRACTS

Index Map
HENZADA DISTRICT.
REFERENCES
Kwins tested in 1891-92
Circle boundaries
Boundaries of Inspectors' divisions
Thugyis' headquarters
District roads and embankments
PROME DISTRICT
TRARRANADDY DISTRICT
UNSETTLED HILLY TRACT
SASSEIN DISTRICT
TESSONA DISTRICT
MAUNG BA ON,
Superintendent of Land Records, Henzada.
Arizo


Index Map
THARRAWADDY DISTRICT
THE KWINS IN WHICH SUPPLEMENTARY SURVEY WORK WAS TESTED BY INSPECTORS DURING 1891-92 AND TWO PRECEDING YEARS
PROME DISTRICT
TAPUN TOWNSHIP.
1. Tayokmyaw Circle.
2. Indaingbo do.
3. Leikhist do.
4. Tajan do.
5. Lidaw do.
6. Kubyu do.
7. Taungnyo do.
GYOBINGAUK TOWNSHIP
8. Sanuggwet Circle.
9. Zigon do.
10. Moss do.
11. Lisayethna do.
12. Kubnaywa do.
13. Myodwin do.
14. Yindaikpin do.
15. Shabinda do.
MINHLA TOWNSHIP.
16. Matsungda Circle.
17. Kyentaik do.
18. Sebnaywa do.
19. Minhla do.
20. Lwinbyin do.
21. Pauktaw do.
SANYWE TOWNSHIP.
22. Taungbohla Circle.
23. Kyem do.
24. Lepadan do.
25. Sadashiri do.
26. Thhoré do.
27. Tharrawaddy do.
MONYO TOWNSHIP.
28. Teindaw Circle
HANTHAWADDY DISTRICT
REFERENCES.
Township boundary
Circle do
Navigable by boat
Kwins tested in 1889-90
Do. 1890-91
Do. 1891-92
Scale = Miles = 1 inch
L. E. PALMER.
Superintendent of Land Records, Tharrawaddy

Index Map
OF THE
THONGWA DISTRICT
SHOWING
THE KWINS IN WHICH SUPPLEMENTARY SURVEY WORK WAS TESTED BY INSPECTORS DURING 1891-92 AND TWO PRECEDING YEARS.
Miles
Name of circle
Township
Remarks
Shwelaung
Pantanaw
Danubyu
Yandoon
Thongwa
Dedayé
Pyapôn
Kwins tested in 1891-92
Thugyis' headquarters
Inspectors' do.
REFERENCES.
TANTABIN C.
MAHLAING C.
KYAUNGGON C.
EINME C.
KYONKAMI C.
HENZADA
THANETHA BAUK C.
TONTAROK
AINGKALAUNG C.
BAKLIN C.
PANHLAING C.
KAN KAWN R.
MAHLAING C.

REFERENCES.
Kwina tested in 1891-92
Thugyis' headquarters
Inspectors' do.
MAHLAING C.
EINDAPUYA C.
LAWADI CIRCLE
RYONKANI C.
EINME C.
KYUNPUATTHAY
SURVEYED
GULF OF MARTABAN
A. W. MUNRO,
Superintendent of Land Records, Thôngwa.

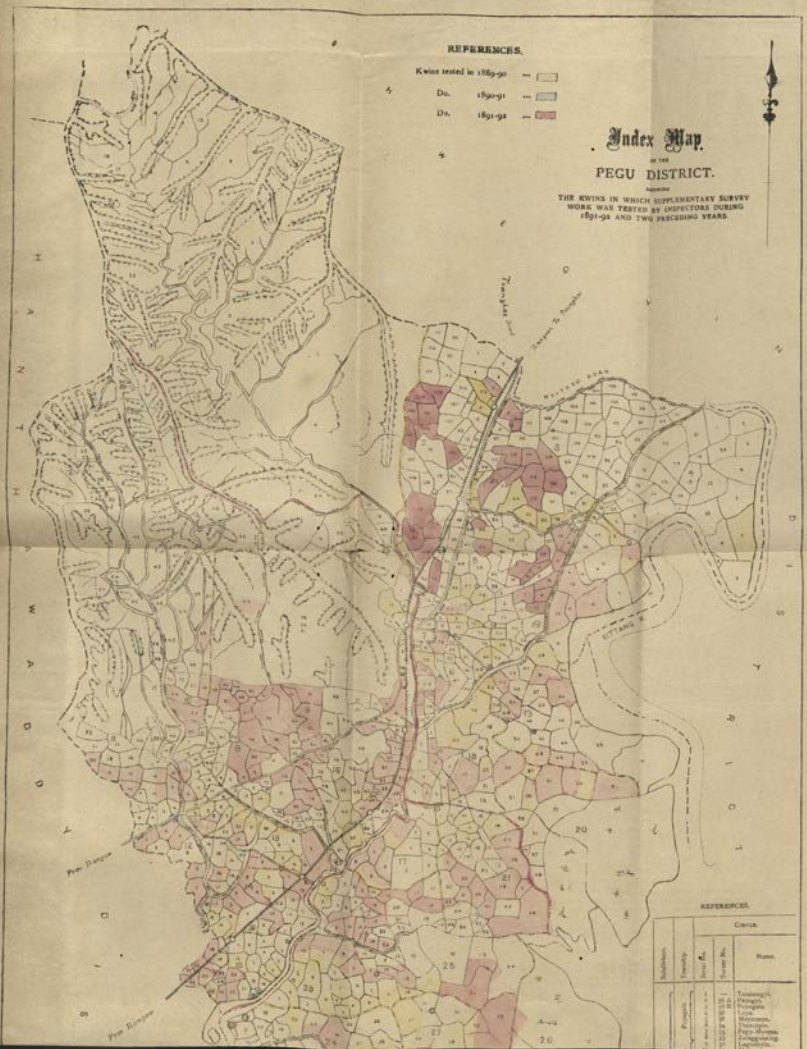
Index Map

OF THE

HANTHAWADDY DISTRICT

SHOWING

THE KWINS IN WHICH SUPPLEMENTARY SURVEY WORK WAS TESTED BY INSPECTORS DURING 1891-92 AND TWO PRECEDING YEARS.


REFERENCES.
Kwins tested in 1889-90
Do. 1890-91
Do. 1891-92
Index Map
OF THE
PEGU DISTRICT.
SHOWING
THE KWINS IN WHICH SUPPLEMENTARY SURVEY WORK WAS TESTED BY INSPECTORS DURING 1891-92 AND TWO PRECEDING YEARS.
SITTANG R.
REFERENCES.
Circle.
Subdivision.
Township.
Serial No.
Survey No.
Name.
Pyingale.

C. P. TORRENS,
Superintendent of Land Records, Pegu.

5/4

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1892-93.

RANGOON: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, BURMA. NOVEMBER 1893.

[Price,—Re. 0-4-0.]

TABLE OF CONTENTS.

REPORT ON THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BURMA, FOR THE YEAR 1892-93.

SECTION I.

	Para.	Page.
Omission of Section I ...	1	1

SECTION II.

ANALYSIS OF DISTRICTS WITH REFERENCE TO SECURITY AGAINST FAMINE.

Revision of analysis of districts ...	2	1
Security of greater part of Lower Burma against famine ...	3	ib.
Security of certain tracts in Lower Burma against famine ...	4	ib.
Revision of analysis ...	5	2
Revision of analysis of districts ...	6	ib.
Receipt of analysis of districts ...	7	ib.
Scarcity of food-grain ...	8	ib.
Rice-exporting districts ...	9	ib.
Analysis of Thayetmyo ...	10	3
Analysis of Tenasserim division ...	11	ib.
Knowledge of districts in Upper Burma ...	12	ib.
Extension of irrigation in Upper Burma ...	13	ib.
Analysis of Pakôkku ...	14	ib.
Classification of areas ...	15	ib.
Principal crops in Pakôkku ...	16	4
Advances to people ...	17	ib.
Myingyan district ...	18	ib.
Magwe district ...	19	ib.
Irrigation works in Magwe ...	20	ib.
Analysis of Minbu ...	21	5
Classification of Kyabin ...	22	ib.
Classification of Legaing ...	23	ib.
Classification of Sidôktaya ...	24	ib.
Irrigation works in Sidôktaya ...	25	ib.
Agricultural advances ...	26	6
Principal crops in Lower Chindwin ...	27	ib.
Food-supply in Ye-u ...	28	ib.
Sagaing district ...	29	ib.
Analysis of Upper Chindwin under preparation ...	30	ib.
Food-grain in Mandalay ...	31	ib.
Analysis of the Ruby Mines ...	32	7
Shwebo ...	33	ib.
Preliminary survey ...	34	ib.
Katha ...	35	8
Rainfall in Bhamo ...	36	ib.
Analysis of districts of the Eastern division ...	37	ib.
Meiktila ...	38	ib.
Yamèthin ...	39	9
Pyinmana ...	40	ib.
Agricultural history of the year ...	41	ib.
Estimate of crops ...	42	ib.
Estimate of rice crops ...	43	ib.
Rainfall in Thayetmyo ...	44	ib.
Estimate of crops in Akyab, Kyaukpyu, Northern Arakan Hill Tracts, and Sandoway ...	45	ib.
Estimate of crops in Tenasserim ...	46	10
Condition of harvest in Tavoy ...	47	ib.
Condition of harvest in Mandalay ...	48	ib.
Condition of harvest in Myingyan ...	49	ib.
Food-supply in Pakôkku ...	50	ib.
Rainfall in Minbu ...	51	ib.
Rainfall in Magwe ...	52	ib.
Rainfall in Sagaing, Lower Chindwin, and Ye-u ...	53	ib.
Harvest in Kyauksè, Meiktila, Yamèthin, and Pyinmana ...	54	12
Export of rice from Lower Burma ...	55	ib.
Price of food-grain in Akyab, Kyaukpyu, and Sandoway ...	56	ib.
Price of paddy in Shwegyin ...	57	12
Export of rice from Moulmein ...	58	ib.
Price of paddy in Tavoy ...	59	ib.
Price of paddy in Mergui ...	60	ib.
Import of rice from Upper Burma ...	61	ib.
Price of food-grain in Mandalay, Shwebo, Katha, Bhamo, and Ruby Mines ...	62	ib.
Price of food-grain in Sagaing, Lower Chindwin, and Ye-u ...	63	ib.

	Para.	Page.
Price of food-grain in Myingyan, Minbu, and Magwe	64	12
Price of paddy in Kyauksè, Yamèthin, and Pyinmana	65	13

SECTION III.

FODDER RESERVES AND ARBORICULTURE.

Grazing-grounds	66	13

SECTION IV.

AGRICULTURAL EXPERIMENTS.

Lashio experimental farm	67	13
Cultivation of wheat in Lashio	68	14
Progress of experimental farm	69	ib.
Experimental cultivation in Southern Shan States	70	ib.
Principle on which experiments are based	71	15
Sagaing wheat	72	ib.
Sale of crops	73	ib.
Potato experiment	74	ib.
Vegetable garden	75	ib.
Orchard	76	ib.
Experiments in wheat cultivation	77	ib.
Sale of wheat	78	16
Cultivation of cotton, potato, and vegetable seeds	79	ib.
Cultivation of American and Egyptian cotton seed	80	ib.
Coffee-planting	81	ib.
Mergui garden	82	17
Agricultural shows	83	ib.

SECTION V.

CATTLE-BREEDING AND VETERINARY ESTABLISHMENTS.

Cost of the civil veterinary establishment	84	17
Employment of Veterinary Assistants	85	18
Cases treated by Veterinary Assistants	86	ib.
Treatment of cattle	87	ib.
Diseases for which cattle treated	88	ib.
Conduct of Veterinary Assistants	89	ib.
Work of Veterinary Assistants	90	ib.
Burma Cattle-diseases Bill	91	ib.
Work of the veterinary school	92	19
Breeding operations	93	ib.
Police duties	94	ib.

SECTION VI.

AGRICULTURAL AND FISCAL STATISTICS.

Rainfall returns	95	19
Weekly crop reports	96	ib.

SECTION VII.

TRADE AND TRADE STATISTICS.

Registration of trade...	97	20
Registration of overland trade	98	ib.
Trade returns	99	ib.
Crop estimate	100	ib.

SECTION VIII.

Officers in charge of department	101	20

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1892-93.

SECTION I is omitted from this report as under the orders of Government the maintenance of the Land Records and Survey are subjects to be dealt with in the Revenue Administration Report and not in that of the Department of Land Records and Agriculture. On the other hand, under the orders contained in Revenue Department Circular No. 7 of 1892, some of the other portions of the report will be fuller than has hitherto been the case.

SECTION II.

ANALYSIS OF DISTRICTS WITH REFERENCE TO SECURITY AGAINST FAMINE.

2. The analyses made in the preceding year were in many cases revised in the year under report, and for many years to come it will be necessary to continue to revise them throughout Upper Burma and to some extent in Lower Burma also.

3. The greater part of Lower Burma is classed as absolutely secure against famine, and no annual revision of the analysis is required from the districts which yearly without fail yield a large surplus of grain. The analyses of Tharrawaddy, Prome, and Thayetmyo have, however, been revised, they being districts in portions of which the crops are liable to suffer seriously from drought. In Tharrawaddy the analysis is now being revised and the classes are being marked off village by village. The tract liable to scarcity will include not only the villages in which the crop is liable to fail owing to drought, but also some of the villages in the hills whose inhabitants trust for the most part to *taungya* cultivation, which is very precarious. For the Prome district an analysis has been prepared with a considerable amount of care, and nearly all the circles in the district have been divided into three classes. It is very doubtful, however, whether there are so many classes in most of these circles, and it will be advisable to revise the Prome report when further information can be procured. The Thayetmyo analysis is at present only by townships, which is quite insufficient, and an analysis village by village should be prepared. Now that a considerable portion of the district has been cadastrally surveyed, there will be more accurate figures to base the estimates on.

4. No analyses of the remaining districts in Lower Burma are now kept up, nor are any of them likely to suffer from scarcity owing to drought. But the crops may fail in some of these districts owing to excessive rain in the early part of the season before the hill clearings (*taungyas*) are burnt. And the tracts in which this may occur are far removed from the sea-ports and without sufficient means of communication, so that it is difficult to get accurate information about their condition promptly, and food-grain is not readily supplied when stocks run short during the rains. On the other hand, the extent of scarcity in these tracts is almost without exception grossly exaggerated when first brought to notice, and local officials (thugyis and township officers) are apt to report scarcity if every household has not abundance of rice, although the people have a certain amount of rice and Indian-corn, and also cattle, pigs, and fowls, which they can and do eat and sell, or barter for rice. Still there is no doubt but that these tracts should be carefully watched. Though they are now classed as secure, many of them were shown in the analysis of 1889 as liable to scarcity and it is now proposed to again class them as to some extent insecure.

5. In Lower Burma then in revising the analysis special attention will be paid to making a better and more minute classification in the districts which to some extent suffer from drought, and to collecting more accurate information about the far distant hill-tracts in which the crop is liable to suffer from excessive rain.

6. While satisfactory progress has been made with the analysis of districts in Upper Burma, there is still much to be done in the way of revision of the analysis in that part of the province. In a note, dated 15th March 1892, the Financial Commissioner pointed out that the revised analyses for Upper Burma, which were coming in, were defective. He remarked that—

"all (the analyses) have a common defect, which is, that they deal with the township as the territorial unit to be considered as a whole in respect of security or otherwise against famine. But as our experience of the last seven months has shown, one part of a township may differ very greatly in respect of security against famine from another; and therefore any analysis which does not enter into more detail than the township area must obviously fail to pourtray the true condition of the country."

Then the note gives in full the orders of the Government of India on this subject as contained in Resolution No. 6-340—50G., dated the 8th December 1881, Revenue and Agricultural Department; and Deputy Commissioners were directed to submit "matured analyses" of their districts not later than the 31st December 1892.

7. The analyses for two districts only were received before the 31st of March 1893, since which date, however, those for most other districts have come to hand. These analyses are scrutinized by the Director and submitted with his remarks to the Financial Commissioner. In some cases it is necessary to return the analyses for correction or explanation, but an improved set of analyses is being steadily compiled, and the revision will be regularly proceeded with. The analysis of the Pakôkku district prepared by the Deputy Commissioner (Mr. A. R. Birks, I.C.S.), was the first received from Upper Burma after the issue of the Financial Commissioner's note of March 1892, and it is also so far the most carefully compiled. This analysis has been circulated to all Deputy Commissioners in Upper Burma, who have been asked to take it as a model in preparing the analyses of their districts.

Information collected as to the liability of each district to scarcity and famine, with a statement of the agricultural circumstances of each tract, and remarks on the protective measures which appear to be needed.

8. As has been noticed above, the tracts in Lower Burma in which scarcity of food-grain is likely to occur are few and unimportant. It was estimated in February last that in the ten chief rice-producing districts in Lower Burma* at the harvest of December 1892 the yield was equivalent to 2,517,260 tons of rice, of which 1,637,000 tons would be available for export to other countries and to Upper Burma, the balance being required for these ten districts and for the districts in Lower Burma in which the rice locally produced is insufficient for the wants of the inhabitants. Of these the principal is Rangoon Town district with its population of 180,000 and but little over 1,000 acres of land under rice. In these ten districts there is no liability to scarcity or famine, except in parts of Tharrawaddy and Prome; and, however advisable it may be to extend the embankments as a protective measure against floods especially in Thôngwa and Amherst districts, such works are not required to guard against famine. An irrigation scheme for the dry tract in Tharrawaddy is under consideration, and in Prome also measures are being proposed for dealing with the difficulty.

9. In the Arakan division there are three districts which are not classed as rice-exporting districts. Of these Kyaukpyu, with more than 100,000 acres of paddy-land and a population of 163,832, does in most years export some rice through Akyab. Sandoway produces almost exactly what it requiries for local consumption; and as the rainfall in these districts is ample and never fails, serious scarcity is not to be looked for. However, there are a few tracts in these two districts in which slight local scarcity may occur for a short time in the monsoon owing to communication by water being stopped. The country is too thinly inhabited for roads to be made, nor is there any probability at present that opening it up would lead to immigration and extension of cultivation. Scarcity is unknown and

* Akyab, Hanthawaddy, Pegu, Tharrawaddy, Prome, Bassein, Thôngwa, Henzada, Amherst, Shwegyin.

not to be expected in the Northern Arakan Hill Tracts where, though the locally-grown rice is not sufficient for the people, the surplus of cotton, oil-seed, and tobacco, which is regularly obtained, enables them to procure their supplies of grain and other necessaries without fail from Akyab.

10. In the Irrawaddy valley there is only one district which is not a rice-surplus district, namely, Thayetmyo. The analysis of the Thayetmyo district is very imperfect. It should be revised on the model of the Pakôkku analysis. The present analysis shows all townships as having no security whatever of an agricultural outturn. No doubt the rice crop in Thayetmyo is liable to suffer from drought, but there are the dry crops to fall back on, which are principally maize, sessamum, tobacco, and cotton; and these as a rule do not suffer from drought in Thayetmyo. Then there are more cattle in Thayetmyo than are required for agricultural purposes in the district and many are sold for use in the lower districts. However, there can be no doubt that something may well be done to improve the agricultural efficiency of this district, and it is probable that some minor irrigation works could with advantage be constructed. But in the first place a better analysis is required.

11. While Amherst and Shwegyin are the only districts in the Tenasserim division that are classed as rice-surplus districts, Toungoo and Tavoy no doubt as a rule export a little, and Mergui and Salween districts require but little grain to supplement what is locally grown. Mergui indeed usually exports some rice, but it also imports at times. Amherst, Tavoy, and Mergui contain considerable areas of valuable orchards and export large quantities of fruit annually. No doubt in all these districts there are tracts in which some slight scarcity may occur for a short time; but, as long as the people practise *taungya* cultivation on the hill-sides there will be times when they will not have quite all the rice they require. They will not emigrate, and they will not take work even when they are complaining of scarcity of rice. These are not cases in which canals or wells are required, for it is excessive rain that causes the loss. Roads would be too costly considering the scanty population and the great distances. In fact, so long as these people adhere to their present practices, Government can do but little for them. However, a careful analysis of all the tracts in this division in which slight local scarcity of rice may for short intervals occur should be prepared and revised from time to time.

12. The information which is available as to the agricultural circumstances of the different districts in Upper Burma is at present by no means full or reliable. However, as already remarked, steady progress is being made towards acquiring a knowledge of the different tracts. The analyses are being revised, several districts have been surveyed, and accurate statistics may be looked for from the Settlement Officers.

13. In Upper Burma it is for the most part drought that is to be feared, and the extension of irrigation is the measure most to be desired.

14. The Deputy Commissioner of Pakôkku has supplied a full analysis of his district. He remarks that—

"the area under class C (in which there is no security of agricultural outturn at all) is large, but the villages are scattered and the greater portion of the district comes under class B (in which the majority of the seasons, but not in seasons of prolonged and disastrous drought, the agricultural outturn is secure)."

15. There is a small area in the A class (in which the agricultural outturn is perfectly secure). It consists of (i) villages protected by irrigation from the river Myittha; (ii) villages in the Yawdwin irrigated by various streams flowing from the Chin Hills which have never been known to fail; and (iii) villages in the Tilin and Pauk townships which possess lands irrigated from or inundated by the Maw, Yaw, and Kyaw rivers. Class B, the tract which, except in very exceptional years, is secure, includes a number of villages in Gangaw in which from their favourable positions among the hills have a rainfall which has never been known to fail altogether and which are situated on streams which are not likely to fail. In this class are also included villages in Tilin, Yawdwin, Laungshè, and Pauk townships whose rainfall is generally sufficient to secure some sort of a crop being produced, and also villages in Myaing along the Yinma

stream where the rainfall is usually sufficient, and the alluvial lands near the river some of which might probably be safely placed in the **A** class. Other lands are classed as **C**, as the agricultural outturn is quite insecure, as there is no irrigation, and the crops depend entirely on the rainfall which often fails.

16. From the analysis of the district it is found that the principal crops are paddy, jowar (and other millets), Indian-corn, and pulses; but jaggery and sessamum are also produced in large quantities. It is estimated that in a favourable season with full crops, if the surplus jaggery and sessamum are exchanged for rice, there would be a surplus stock of food-grain amounting to some 15,000 tons, the surplus being very large in the Pakôkku township, where it is estimated that over 100,000 viss of jaggery are produced, and that the outturn of beans and peas is some 627,263 nine-gallon baskets a year. On the other hand, there is always a deficiency in Yesagyo and in the Pauk and Gangaw subdivisions, but a small surplus in Yawdwin. However, favourable seasons cannot always be looked for in Pakôkku and in any case the district always imports rice.

17. It has been found to be advisable to make advances to the people to enable them to buy cattle and seed in this district, and it will probably be necessary to do so in the future, otherwise cultivators will have to sell their plough cattle after bad seasons. It is said that the advances made have borne good results, and the extension of time to two years has been "gratefully accepted," and two years appears to be a short enough time within which to pay back an advance for cattle. There are no large irrigation works in this district, but a considerable amount of irrigation is carried on by the villagers.

18. The Myingyan district generally is not secure from famine, and in 1891 there was considerable scarcity there, which was most felt in the Taungtha, Tanaungdaing, Myingyan, and Natogyi townships. When the Financial Commissioner visited the district in January 1892, he found the jowar crop better than in Meiktila and Yamèthin, but the principal crops, which are paddy, cotton, and sessamum, had failed, and they will no doubt be always liable to fail if the rainfall alone is to be trusted to. The Financial Commissioner then (January 1892) recorded his opinion that the "best form of relief labour in Myingyan, as in Yamèthin and Meiktila, will be the restoration of old irrigation tanks and reservoirs and the construction of new ones." And such works are no doubt the best means of protection against famine. The Financial Commissioner found that in the south-east of the district the most suitable means of irrigation was by small village tanks, whereas in the centre and north of the district irrigation projects should be undertaken by which large quantities of water now carried off to the Irrawaddy by periodical freshets could be stored.

19. It is estimated that in a favourable year there would be a surplus of grain in each of the three subdivisions of the Magwe district. In Yenangyaung, where the crops are principally maize, beans, and millet, the annual surplus in favourable years is estimated to be 14,000 tons, and large quantities of sessamum are also produced. On the islands in the Irrawaddy the agricultural outturn is secure in most seasons. In the other parts of the subdivision crops depend on the rainfall, which is capricious. There is but one irrigation work which is not yet permanent and cannot be relied on. In the Taungdwingyi subdivision, where the principal crop is paddy, there would in a good season be a surplus of 15,500 tons of grain, and a considerable quantity of sessamum is also produced. The crop for the most part depends on the rainfall which is capricious. There are some private temporary irrigation works which cannot be relied on. In the Natmauk subdivision there would, it is estimated, be in good years a surplus of 1,200 tons of grain, consisting of maize and millets. Sessamum is also largely grown. In parts of the subdivision the agricultural outturn is secure in most seasons owing to two tanks which have been made by the Public Works Department and to private irrigation works on the Yinchaung; but in the greater part of the subdivision the crops are dependent on the rainfall, which is very uncertain.

20. There are many small irrigation works in the Magwe district, but there can be no doubt that the agricultural efficiency of the district will improve if

old works now out of repair are attended to and new schemes taken up. The people are most anxious to have their irrigation works restored. Some tanks have been repaired by Government, and other projects are being considered which include the irrigation of some of the best paddy-land in Taungdwingyi.

21. The analysis of the Minbu district has for the most part been prepared village by village and appears to have been done with care, except the portion referring to the Minbu subdivision which is inaccurate and in some respects badly arranged. A large portion of Salin township is classed as secure in all years (A) as it is protected by irrigation works. The surplus of paddy in a favourable year in this tract of Salin is estimated to be 258,063 nine-gallon baskets; jowar is also grown to a considerable extent; and there is also some maize, gram, and peas. There is also a large tract in Salin classed as secure in ordinary years, but not in times of prolonged and severe drought. Here the crops are liable to fail if there is no rain and to a great extent too, if the river does not rise and submerge the low-lying lands. In this tract, with a consumption of 251,177 baskets of paddy, the yield in a favourable year is only 255,602 baskets; but millets, peas, maize, gram, and wheat are produced in considerable quantities. There is also in this township a small tract classed as quite insecure as the crops are always liable to fail owing to want of rain, though in years when a good harvest is reaped there is a surplus of paddy and millets.

22. In the Kyabin township there is a large tract of land which is classed as quite secure owing to its being well irrigated, and yet the food-grain locally produced never suffices for the wants of the people. This is owing to the Sinbyugyun block being included. It contains 10,000 inhabitants and only a small amount of cultivation. If that block be excluded there would in good years be a surplus of some 50,000 baskets of paddy in this tract of Kyabin; and millets, wheat, maize, peas, and gram are also grown to some extent. The portion of Kyabin, classed as ordinarily secure, but not so in exceptional years of drought, is shown as exporting 22,000 baskets of wheat and also peas, gram, and millet, in considerable quantity, whereas the paddy produced is always insufficient. Next there is in Kyabin a small insecure tract producing no paddy and mostly jowar, but not enough of that for the people living in it. Here, however, the people earn money by selling house-posts and firewood in Sinbyugyun.

23. Lègaing township contains a tract (A) classed as secure with an annual surplus of rice; a tract (B) classed as insecure in exceptional years of drought growing no paddy, but a large amount of jowar, other millets, Indian-corn and sessamum, and in good years yielding a net surplus of grain; and a small tract (C) in which the outturn is quite insecure and the grain produced always insufficient for the population.

24. In Sidôktaya rice is largely grown and the greater part is classed as secure and yields a surplus, but there is also a small tract in which the grain produced is barely enough for the people. Paddy is the principal crop in Dabwin, but is not produced in sufficient quantity for local requirements. All the villages in the Sagu and Ngapè townships of the Minbu subdivision are classed as either perfectly secure or as secure except in years of long and unexceptional drought. Paddy is the crop most largely grown in the subdivision; but peas, maize, and wheat are also cultivated. In many of the villages in this subdivision the grain locally produced is not sufficient, but the people are not all cultivators simply,—some are traders, others prepare cutch, cut bamboos, or make thatch.

25. There are some very useful irrigation works in this district which may, however, with advantage be improved and extended. The principal works are the Sagu-Sedaw, Nyaungmadaw, Nyaungthit, Mingala, Thayetchin, Kaing, Nwetamè, and Thadunwa. Considerable sums are spent on the up-keep of these works for which purpose money is collected from the cultivators. The Deputy Commissioner thinks that when these works come directly under the control of Government, the district will be safe against famine. The Commissioner sees no necessity for great expenditure and prefers to keep up the works in the Burmese method. It is no doubt desirable that the petty irrigation works throughout the district should be kept in order as the Commissioner advises.

26. Agricultural advances may be required in the future as in the past in Minbu, but the Commissioner considers it necessary to point out that they should be given out with great care.

27. In the Lower Chindwin district the principal crops are jowar and other millets, sessamum, cotton, beans, and paddy. It is estimated that in a favourable season the grain locally produced would be some 13,500 tons less than that required for consumption. The analysis of this district was prepared with care, but it is not drawn up exactly on the lines laid down and it is being revised. Agricultural loans have been given out with good results, people being thereby enabled to buy seed and plough cattle, and as much of the district is not secure against scarcity, similar loans will no doubt be required in the future. Irrigation tanks are greatly needed in the Lower Chindwin and it is hoped that some good sites for large reservoirs may be found. Meantime, there are tanks to be made or repaired which will be of great use. The Financial Commissioner is of opinion that an inundation canal could be cut from the Chindwin so as to throw the flood-water into tanks in the Mônywa and Kudaw townships whence it could be distributed.

28. It is estimated that in the Ye-u district the food-supply produced in a favourable season would in each township more than suffice for the wants of the people, but the surplus in the whole district would with a good harvest be only some 2,000 tons. Still no part of the district is quite secure against famine, and there are tracts which are at no time secure. Paddy is the staple crop, and the rainfall is very often not sufficient.

In the Ye-u district, owing to the losses the people sustain by repeated bad harvests, agricultural loans will probably be required for years. The cultivators have received large advances for which they are said to be particularly grateful, and the Deputy Commissioner thinks that there is no reason to apprehend difficulty in recovering outstandings.

Irrigation works are much required in Ye-u where the rainfall is capricious and insufficient. Some tanks were repaired last year and a considerable allotment has been made for irrigation works in the current year. The Financial Commissioner, however, on visiting the district in January 1892, remarked that—

"there are very few irrigation tank projects possible in the district. The country is flat except in the far north, drainage channels are few, and large reservoirs are impossible."

However, there were tanks to be repaired to which the Financial Commissioner drew attention, and he also suggested some large projects by which the water from certain streams might be distributed over the paddy-plains. These schemes would be costly, but would, if successful, be very remunerative and the best safeguard against famine.

29. The portion of the Sagaing district which is most liable to famine is the Sadaung township and the adjoining villages in Sagaing township. In January 1892 the Financial Commissioner on visiting this tract made the following remarks:—

"the country is chiefly upland, of a light soil, and very irregular in surface. Sessamum, cotton, and jowar are the principal crops. Paddy is not much cultivated. In the north-east corner a little wheat in grown. There is a fair amount of pasture in seasons of sufficient rain and the people breed cattle to some extent. The harvest varies greatly according to season. Everything depends on good and timely rain. In 1890 the season was very unfavourable. In 1891 the rains were scanty and untimely, and the consequence has been a harvest insufficient to feed the population."

Irrigation works are greatly needed in this part of the country. "The country is well suited for reservoirs," the Financial Commissioner remarks, and "irrigation is the cure of all the evils with which we are now contending."

30. The Upper Chindwin district is as a rule a rice-exporting district to a small extent. The information available at present about it is not extensive, but the Deputy Commissioner gives an assurance that his analysis is being very carefully prepared.

31. In the Mandalay district large quantities of food-grain are imported for the people of the town. The crops in the district are to a great extent liable to fail as the irrigation works are incomplete. In the analysis of the district it is esti-

mated that even in a favourable season food-grain produced in the Madaya subdivision would be 7,241 tons less than what is required by the people, there being a deficit in both townships, though 23 villages in Madaya township and 56 villages in Singu are classed as quite secure. The people could, it is said, earn money in times of scarcity by cutting bamboos and firewood and making charcoal. Paddy is the staple crop in this subdivision. The whole of the Amarapura subdivision is classed as secure in ordinary but not in exceptional seasons of prolonged drought. Here paddy, millets, and Indian-corn are grown, and in favourable years there is a surplus estimated at 1,000 tons of grain. The Pyinulwin subdivision is also classed as secure in ordinary years, but not in years of great and prolonged drought. Besides rice, there are grown in this subdivision ginger, groundnuts, and *pein* (*colocasia antignorum*).

Much can be done in this district by extension of irrigation. Schemes are now being considered and the people are reported to be anxiously looking for their fulfilment. A considerable area was irrigated from the existing irrigation works this year, but they are quite insufficient.

Agricultural advances can be usefully made in Mandalay district. They have helped to encourage the cultivation of wheat which is extending in a satisfactory way.

32. From the analysis of the Ruby Mines district it appears that the Mogôk subdivision, though never producing enough grain for local requirements, is secure from famine as the people can afford to buy, and rice is imported steadily from Mainglôn and Möngmit, which latter is always secure and has a surplus for export. The Tagaung subdivision is not so secure, and the crop locally raised is not sufficient for the people. Supplies are brought up the Irrawaddy.

There are no large irrigation works in the district, but irrigation is, in the Deputy Commissioner's opinion, much needed in the Twinngè township. In the Tagaung township, too, there are some minor works which will be examined. The people have been assisted with agricultural loans to enable them to buy plough cattle. The benefit that has accrued is, the Deputy Commissioner reports, inestimable; and these advances may with advantage be made in the future.

33. No part of Shwebo district is as yet classed as quite secure though when the irrigation works are restored some villages, which are now liable to scarcity, will become secure. Portions of the Shwebo, Chaukywa, and Myedu townships are, however, secure except in years of long and severe drought, and in favourable years there is a large surplus of rice in those townships. The tracts in these three townships, which are generally secure, are irrigated from the Mu canal, the Mingaung canal, the Singat tank, Gyo-gya tank, and the Pindin tank. The Malè, Sheinmaga, and Hladaw townships are classed as always insecure, and in these the crop is never sufficient for the wants of the people. There are, however, small tracts in them which are irrigated from tanks. Shwebo is a district differing considerably from those lying to the south of it, as rice is the staple crop, and millets, Indian-corn, peas, and maize, are but little grown except in the south of the district, where cotton and sessamum are also grown. The rainfall alone is not sufficient for a paddy crop, and irrigation is required throughout the district. Owing to old irrigation works being insufficient and out of repair, the crops have failed to a considerable extent in past years, and there can be no doubt but that to make the district secure it is necessary to repair the old works and to carry out new projects. The Financial Commissioner visited the district in January 1892. The tract of country then suffering from scarcity lies between the Mu river and the Mu canal and extending to the north of Tantabin and to the south of Kin-u. "The whole of this tract, which is a fine paddy-growing country, would," the Financial Commissioner remarks, "be irrigable by the Mu canal" so that "it is hardly necessary to point out the enormous importance of the canal to the welfare of the district and the serious loss of crop and revenue caused by delay in its completion."

34. The preliminary survey for the Mu canal restoration scheme has this year been carried on and it is hoped that the work may be actually undertaken shortly. A considerable sum was during the year spent on sixteen irrigation

works (principally tanks) in this district, and some of the works made in Burmese time may with advantage be repaired.

Agricultural advances have been made in this district which are appreciated by the people, though in some cases the seed purchased with advances was of little benefit owing to bad seasons. However, the fact that crops have failed more or less for several years makes it all the more desirable to help the people with advances.

35. A portion of Mawnaing is the only part of the Katha district that is classed as perfectly secure against famine. It is irrigated from the Daungyu, a permanent stream. A block in Kawlin with 2,500 inhabitants is never secure of an agricultural outturn, and the rest of the district is classed as secure in most years, but not in exceptional years of long drought. Rice is the staple crop and there is a surplus of it throughout the district generally in favourable seasons. In Katha, Malè, and Tigyaing, fisheries produce a considerable source of income, and in Pinlèbu and Mansi the extraction of forest produce affords occupation for many. In Katha there are as yet no extensive irrigation works. The Daungyu irrigation system, however, in Wuntho is a valuable one and is capable of extension. The rainfall is heavier than further south, but still it is said to be insufficient, and extension of irrigation will probably be required.

36. In the Bhamo district the rainfall generally is much heavier than in the central districts of Upper Burma. There are no irrigation works at present, and the crops, of which rice is the principal, suffer at times from drought and in some years from floods and insects.

Over Rs. 16,000 have been advanced to cultivators to enable them to buy buffaloes, and it is said that these agricultural loans have been much appreciated and promptly repaid. As this is so, further loans may be made in the future with advantage when required.

37. Analyses have been received for all districts of the Eastern division. The greater portion of the Kyauksè district is classed as absolutely secure against famine, the canal system being so extensive and so well attended to that there is practically no danger of any general failure of crop. However, the Deputy Commissioner has classed as insecure in exceptional years (B) a number of villages which, when more land is brought under cultivation and irrigation is extended, will be classed as perfectly secure. These villages are mostly along the Samôn and Panlaung rivers on the north-west border of the district. The unirrigated villages are classed as insecure. Chillies, onions, beans, and tomatoes are grown in this tract, the greater part of which lies on the south-west of the district, and with these are also included a few villages on the east which lie too high to get water from the irrigation channels. There is no doubt but that with the extension of irrigation, villages now classed as insecure will become safe. The canals generally are in good order, but some regulation at the heads of certain canals is required; and on these points information is now being collected.

38. No land is classed as perfectly secure in Meiktila, but all townships, except Mahlaing, which is all classed as insecure, are shown as partly secure in the majority of seasons, but not in seasons of prolonged drought, and partly insecure at all times. Mahlaing is a cotton-growing township and the local production of food-grain there is never sufficient for the wants of the population. In the other townships the crops are rice, millets, peas, and sessamum, and the rainfall being very capricious all villages are classed as insecure except those under the larger and more certain irrigation works. These are in the Wundwin township the villages near the Meiktila, Myin, Wundwin, Ngathet, and Kandaw tanks; in the Thazi township,—the villages near the Meiktila and Nyaungbinhla irrigation works; in the Meiktila township,—the villages getting water from the Meiktila lake; and in the Pindalè township,—the villages near the Myin irrigation works. The protective measures required in this district are without doubt irrigation works. Some excellent work has already been done in Meiktila; many tanks have been made or repaired, and weirs erected.

Agricultural advances have been made in the Meiktila district and, in the opinion of the Commissioner, they were required as they enabled a crop to be

raised by cultivators who would otherwise have been unable to sow. This being a great cattle-breeding district, the want of plough cattle is not usually felt. Still by a succession of bad seasons some of the people may be reduced to such a condition as to require loans to enable them to buy cattle.

39. There is only one tract classed as perfectly secure against famine in Yamèthin district. It lies to the south-east of the district and contains a population of 9,000, and it is estimated that the annual surplus of food-grain in it is 1,200 tons. The tracts which are secure in most years, but not in cases of severe and prolonged drought, contain 39,000 people and are scattered about the district lying under the larger and more certain irrigation works. In the remaining tracts there is no security as the rainfall is very light. The principal crops are paddy, millets, Indian-corn, and peas. With extension of irrigation some of the insecure tracts will doubtless become safe. Some excellent irrigation work has been carried out in this district and plans for further developing the system have been considered.

The people in Yamèthin will no doubt from time to time require to be assisted with agricultural loans to enable them to purchase seed or plough cattle, but with the extension of the irrigation system these advances would probably become less necessary.

40. There is no probability of famine in the Pyinmana district, as in the greater part of it the rainfall is much more secure than in the other districts of the division; but still the Deputy Commissioner has classed only 28 villages as absolutely secure: these lie along the Yezin chaung in the Paunglaung township. The greater portion of the district consists of villages which lie low or are irrigated by streams which rise in ordinary years and villages in which hill clearings are made, which are all classed as secure from failure of crops in ordinary years, though not in exceptional years of prolonged drought. The remaining villages are classed as insecure as their lands lie high and not being irrigated the crops are liable to fail except when rainfall is exceptionally good.

The conditions of Pyinmana are very different from those of the other districts in the division, and the Commissioner doubts the expediency of starting extensive irrigation works in this district as all the streams are used for floating timber.

In this district much land is lying waste that was formerly cultivated, and it is advisable to induce the cultivators of hill-clearings to take to permanent cultivation. Plough cattle are much needed and advances are very properly made to enable people to buy them.

Agricultural history of the year.

41. In Lower Burma the rice harvest of the year was a very good one. The rainfall was ample and on the whole well distributed, and very little damage was done by flood.

42. In the Hanthawaddy, Pegu, and Tharrawaddy districts it was estimated that there was a 17-anna crop. In the last named district there was a good crop in the dry zone where crops had more or less failed for several years in succession. Crops were reported to have been destroyed by floods or other causes on 2,460 acres only in these three districts. In Prome it was estimated that there was an average harvest only.

43. In the three principal rice-growing districts of the Irrawaddy division, the estimates of the rice crop were as follows:—Thôngwa 18 annas, Bassein 17 annas, and Henzada 16 annas. No serious damage was reported from any of these districts.

44. In the Thayetmyo district the early rainfall was favourable, but owing to the later rainfall failing the harvest was a poor one. It is said that in the Lower Burma portion of the district the paddy crop was but little over half a crop, while in the Upper Burma portion sessamum, which at first promised well, became more or less a failure.

45. It was estimated that there was an 18-anna crop in the Akyab district where the rice harvest was certainly a good one, and there was very little damage due to flood. In the Kyaukpyu district the rice crop was generally a good one: the yield is said to have been somewhat light in the Kyaukpyu township owing to the rainfall being unevenly distributed. In the Northern Arakan Hill Tracts the

paddy, cotton, and oil-seed crops were good and abundant, but the tobacco crop was short. In the Sandoway district the rice harvest was below average owing to the rainfall in October and November being short.

46. It was estimated that in the two principal rice-surplus districts of the Tenasserim division, namely, Amherst and Shwegyin, there were at last harvest 16 and 18-anna crops respectively. In the former district the later rains were somewhat light, still the harvest was a good one, but some damage was caused by salt-water inundation in the Wagaru and Bilugyun townships. In the Shwegyin district the rainfall was well distributed and the rice harvest was a very good one; and this was also the case in the plains throughout the adjoining district (Toungoo): but there some heavy rain fell before the hill-clearings had been burned and in some parts of the hills only half a crop was gathered.

47. In the Tavoy district the harvest was a poor one owing to the rain being unevenly distributed, and paddy was imported from Rangoon and Moulmein. The sessamum crop also in this district was a poor one, and the fruit season was not a very good one, mangoes being damaged by insects. In the Mergui district, too, the rice harvest was somewhat below average, owing to the rainfall being light towards the close of the season. It is estimated that there was only a 13-anna crop. Fruit cultivation is steadily increasing in this district, and durians and mangosteins are largely grown for local consumption and export. In the Salween district the harvest was good, the rainfall, though less than in the year 1891, being well distributed.

48. In the Mandalay district the harvest generally was better than in the preceding year and yet there was by no means a full yield throughout. In the beginning of the season the rainfall was copious, but later there came a drought when the crops suffered considerably, and owing to the river rising to a high level some rice crops were destroyed; while as these floods did not subside till after the usual time, the dry-weather crops on the islands were retarded and suffered. In the Shwebo district the harvest, except in the north of the district, was a very poor one owing to the rainfall being unevenly distributed. In the Ruby Mines district the crops were damaged by heavy rains towards the close of the season. In Katha there was on the whole a good season, but the crops suffered from drought in parts of Kawlin subdivision, while in Pinlèbu agricultural operations were delayed owing to the rains being late and the outturn at the harvest was lower in consequence. In Bhamo district there was a good harvest except in the Sinkin township, where much damage was done by floods.

49. The harvest in the Myingyan subdivision of the Myingyan district was above average, but this was not the case in the other parts of the district, where the crops were poor owing to the rainfall being short and badly distributed. The rainfall at Myingyan itself was 23 inches as compared with 21 in the preceding year.

50. In the Pakôkku district the food-supply produced in the district was as usual not enough for the wants of the district, but sufficient quantities were imported. In the Gangaw subdivision the harvest was only fair as the rainfall was badly distributed, but in the other subdivisions the harvest was better than in 1891-92.

51. In the Minbu district the rainfall was below the average. However, in the Minbu subdivision the paddy-crop was fair except in Ngapè township; but it was very poor in the Salin subdivision, where it is the staple crop, while the jowar along the river failed. On the other hand, the crops raised on the islands, such as gram, beans, and maize, yielded well.

52. In the Magwe district the rainfall was somewhat below average and also irregular, the rain at the close of the season failing; still in the Taungdwingyi subdivision the paddy crop, though a little below average, was fair and a considerable quantity was exported. In the Yenangyaung subdivision sessamum (the staple crop) and maize yielded well, while the millets suffered from the failure of the later rains. The scarcity of the preceding year was felt in the early part of the year under report, but later the food-supply became abundant.

53. In the Sagaing district the rainfall was above average and ample throughout the district, so that the scarcity of the preceding year soon ceased to exist. Further, as the river rose to a high level the lands, which depend on the overflow

from it produced good crops. Throughout the district the crops generally were good.

In the Lower Chindwin district the rainfall (36·9 inches) at headquarters was a little more than double that of each of the two preceding years and was 7 inches above the average. But the rainfall throughout the district varies greatly, and as there was only one rain-gauge in the district, figures for other places are not available. On the whole the harvest, while still below the average, was better than that of the preceding year. Wet-weather crops were fair except in Ayadaw. Sessamum, cotton, and jowar were fair except in Ayadaw and Kani townships, where they were still far below the average. But gram and pulses were fair throughout the district.

In the Ye-u district the rainfall was 37·43 inches as compared with 24·44 inches in the preceding year, and there was a good harvest. In the Upper Chindwin district the rainfall was sufficient, and the harvest throughout the district was good, and grain was exported to the Lower Chindwin district.

54. In the Kyauksè district the harvest on the whole was good, as there was in most villages plenty of water available from the canals. But the Kaukkyi paddy-crop suffered considerably from want of rain in July and August in certain villages in which the canal water was scarce, while in April the very heavy rain damaged the dry crops to a serious extent.

In the Meiktila district the rainfall was above the average, but it was badly distributed. In the Meiktila subdivision there was drought in June, July, and September, and paddy nurseries were destroyed and jowar failed: but the early sessamum was fair. In the Mahlaing subdivision cotton (the staple crop) was fair, the rainfall being more evenly distributed. In the Wundwin subdivision the harvest was very poor. The early crops suffered greatly, and the Kaukkyi paddy and jowar were a complete failure. Sufficient water did not come down from the hills to fill the tanks so that there was but little irrigation. The grain produced in the district was insufficient and was supplemented by imports from Kyauksè and Lower Burma.

In the Yamèthin district the rainfall was unseasonable, there being a heavy fall in April when it was not required and drought in the later months. In the Pyawbwè township the crops failed to a great extent, but in Yindaw and Yamèthin townships the outturn was better than last year.

In the Pyinmana district the rainfall registered at headquarters was 60·17 inches, and the harvest in the greater part of the district was the best there has been for years. But want of rain in October and November caused some failure of crops in the north and north-west of the district.

55. In the year 1892 there were some 1,300,000 tons of rice exported from Lower Burma including 166,000 tons sent to Upper Burma. In Rangoon the price of paddy at the beginning of the financial year (April 1892) was very high, namely, Rs. 138 the 100 baskets. It rose to Rs. 142 in May and then gradually fell until December, when it was Rs. 105. The price in January, after the new crop came to market, fell to Rs. 78—80, and until after the close of the year (March 1893) there was but little further change. The merchants in Rangoon have during the season been able to combine and keep prices down, otherwise there would hardly have been a fall of more than 40 per cent. between April 1892 and March 1893.

Prices of paddy in the remaining districts of the Pegu and Irrawaddy divisions fluctuated as usual with Rangoon prices, but prices at Thayetmyo have not fallen so low as at the sea-ports.

56. In Akyab (from which port 190,000 tons of rice were exported) prices were not so high as in Rangoon. In April 1892 Rs. 90—96 were paid in Akyab for 100 baskets and later Rs. 88 was the price quoted, though the season closed early and little business was done in the latter months of the year. When the new season opened in January at Akyab paddy sold for Rs. 84, but at the close of March Rs. 88 was the price paid. The fluctuations at this port then were not nearly so marked as at Rangoon. In Kyaukpyu the price of paddy was throughout the year considerably higher than in Akyab. It is reported that trade there was considerably affected by an outbreak of smallpox which prevented traders going

about. In Sandoway the price of paddy per 100 baskets has been a few rupees above that paid in Akyab, but lower than the price current in Kyaukpyu.

57. In the Shwegyin district the price of paddy has for the most part fluctuated with that in Rangoon, and this was also the case in Toungoo, except that there prices rose for a short time to Rs. 130 in September, and in 1893 prices in Toungoo have been somewhat above those paid in Rangoon owing no doubt to the demand for Upper Burma.

58. In the year 1892 there were exported from Moulmein some 97,000 tons of rice, nearly the whole of which was grown in the Amherst district.

At Moulmein in April 1892 Rs. 138 were being paid for paddy, and there was no great change until August, when the rate fell to Rs. 120, which was nominally the price till October, when Rs. 110 were paid: but in these months very little business was done. At the end of December the price was Rs. 95, and there was a further fall in January to Rs. 85, while in February it was only Rs. 78, which was also the price throughout March.

59. In Tavoy, in April 1892, the price of paddy was Rs. 118—120 the 100 baskets. It rose somewhat in July and then became again Rs. 120 until September, when it gradually fell till December, when the price was Rs. 107. In January 1893 the price was Rs. 110; in February it fell to Rs. 100, and then rose to Rs. 115; and in March to Rs. 130.

60. In Mergui the price of paddy in April 1892 was Rs. 120; later it rose to Rs. 140, but in November it fell to Rs. 125—130, and at the close of 1892 it was Rs. 100—110. This was the price till February, when it rose to Rs. 110—120. Rice was imported to Mergui from Rangoon and a small amount was exported to Siam from the Maliwun township.

61. As has been already mentioned, Upper Burma imported 166,000 tons of rice from Lower Burma in 1892, whereas in 1891 only 85,000 tons were required; but of the total amount taken by Upper Burma in 1892 about 100,000 tons were imported in the first six months of the year, and later on the demand in some districts became less and less as fair harvests were reaped.

62. In Mandalay the prices of food-grains were somewhat lower as a rule than in the previous year, the average price of rice for the year being Rs. 370 per 100 nine-gallon baskets as compared with Rs. 392 in 1891-92. As usual rice was imported from Lower Burma. The prices of wheat and gram, however, were stationary. In Shwebo, on the other hand, the average price of rice was Rs. 383 as compared with Rs. 336 in 1891-92, and the prices of sessamum and pulses also rose considerably while that of millets fell. Large quantities of rice were imported from Lower Burma. In the Katha district the average price of rice in the year was Rs. 372, the price being highest from June to October when stocks were low owing to the short harvest of the year before. Grain had then to be imported. In the Bhamo district the average price of rice was Rs. 300 as in 1891-92. The locally raised grain was sufficient for the wants of the people except in Bhamo and Mogaung townships; but the rice imported from the Shan States sufficed to make up the deficiency. Most of the food-grain in the Ruby Mines district is imported and prices rule very high, but the people can well afford to pay them.

63. In the Sagaing district the price of rice and millets fell considerably, the average being Rs. 300 and Rs. 90 respectively for the year as compared with Rs. 350 and Rs. 100 in 1891-92. The food-supply was ample and grain had not to be imported from Lower Burma as in 1891-92. The price of wheat remained the same as in that year, while in the adjoining district (Lower Chindwin) the average price of wheat rose from Rs. 197 to Rs. 240 the 100 baskets owing, it is said, to a better demand for natives of India. On the other hand, the average price of rice in the Lower Chindwin fell from Rs. 418 (the price of 1891-92) to Rs. 331, and jowar and peas were also cheaper. Rice was imported from the Upper Chindwin when prices were also lower than in 1891-92. In Ye-u the average price of rice was lower than in 1891-92, but from April to July (1892) it was Rs. 400 the 100 baskets and it gradually fell until February, when it was Rs. 200 only. The prices of gram and peas also fell considerably.

64. In the Myingyan district the prices of food-grains were lower than or in some cases the same as in 1891-92, except in the case of wheat, which sold for Rs.

400 the 100 baskets as compared with Rs. 250 in the year before. The Deputy Commissioner considers that this is due to wheat becoming better known and there being a better demand for it than formerly.

Rice was as usual largely imported in the Pakôkku district, other produce, such as pulses and jaggery, being exported. The price of rice was on the average Rs. 360 as compared with Rs. 400 in 1891-92. The price of millets, too, fell.

In Minbu the average price of rice fell from Rs. 400 to Rs. 275, owing to the crops being better than in 1891-92 and to rather more rice being imported from Lower Burma than was required at the time. In this district, too, the price of wheat fell.

In the Magwe district a considerable amount of paddy was exported from Taungdwingyi to the river and to Yamèthin and Meiktila and to the Natmauk subdivision of Magwe, which in turn exported sessamum, which also was exported from Yenangyaung. The average price of rice in the district was Rs. 320 as compared with Rs. 400 in 1891-92.

65. In the Kyauksè district the price of paddy was Rs. 5 lower than in 1891-92, and it was exported to Mandalay and Meiktila in which district the grain locally produced was not sufficient for the people. Notwithstanding the short crop in Meiktila, prices were but little higher than in 1891-92, the average price of paddy in the two years being almost the same, while rice was Rs. 450 as compared with Rs. 427 in 1891-92. On the other hand, the price of jowar rose from Rs. 100—110 to Rs. 119. As the Deputy Commissioner remarks:—

"The imports by rail steadied the prices and at the end of the year Lower Burma rice was procurable at Rs. 300 the 100 baskets at the railway towns."

Yamèthin, too, depended to a great extent on imports from Lower Burma and also got rice from Taungdwingyi, but the price was lower on the average than in 1891-92, namely, Rs. 423 as compared with Rs. 450. Indian-corn and millets were also considerably lower in price than in the preceding year.

In the Pyinmana district the food-supply was sufficient and grain was exported from Wanwègôn and Taungnyo to Magwe and Yamèthin districts, while in Pyinmana town grain is still to some extent imported from Lower Burma. The price of rice was Rs. 275 on the average as compared with Rs. 375 in 1891-92.

SECTION III.

FODDER RESERVES AND ARBORICULTURE.

66. The paragraph in the Revenue Report contains all available information about grazing-grounds. Encroachments in the grazing-grounds in some districts have become very common. This is especially the case in Pegu, Bassein, Tharrawaddy, and Amherst. In Pegu, though the maximum penalty for the trespass is usually imposed, prosecutions do not in the least deter the offenders.

New grazing-grounds have been reserved in several districts, but certain blocks of land which had been reserved have also been thrown open, and this has been done for good reasons no doubt in some cases; but here and there it is feared that the selections of Settlement Officers which were made with care have not been adhered to and lands have been thrown open which they recommended to be reserved for grazing. Perhaps in some cases the lands which it was proposed to reserve are rather large for present requirements, but in districts in which cultivation is rapidly extending the grazing-grounds which now suffice will become insufficient before long.

SECTION IV.

AGRICULTURAL EXPERIMENTS.

Lashio experimental farm.

67. The Lashio farm was opened principally with a view to encouraging the cultivation of wheat. In 1892-93 for the first time wheat was successfully grown on the farm. Twelve

acres of land were sown with Punjab wheat at the rate of 100 lbs. to the acre in the middle of September after the land had been thoroughly ploughed and manured at the rate of forty cart-loads to the acre. The seed germinated well and the crop grew steadily. Another plot of five acres of land was sown with seed saved on the farm after being similarly prepared and this also succeeded. On the other hand, land sown with seed purchased in Mandalay failed, but this was sown in the middle of October when the rain was too heavy for it, whereas this rain was required for the wheat sown the month before. However, the officer in charge of the farm (Mr. Hillier) doubts if wheat is likely to succeed at Lashio as the soil generally is too light and the rainfall in October, November, and December too scanty. But the Superintendent of the Northern Shan States thinks that this is too despondent a view to take of the matter, and that if the land is sown in September instead of October success may follow this year, but the climate is capricious and the rainfall would often be unsuitable.

68. It is remarkable that here as in the Southern Shan States, where the cultivation of wheat is succeeding remarkably well, the Burma wheat does not appear to thrive so well as soft wheat from the North-West Provinces or the Punjab.

Other crops generally succeeded. Good crops of maize, beans, peas, gram, dhall, ragi, and paddy were secured. Millets grew well, but were destroyed by rain before being harvested. Cotton was sown in three fields. The "seed, though old, germinated well," Mr. Hillier reports, "but died off after two or three weeks' growth. The farm soil is evidently not dense enough and is unsuited for this crop."

69. There was an outbreak of rinderpest on the farm which was checked by prompt segregation. Three of the cows and five calves died, and also two of the working bullocks. Fifteen calves were born. The amount of milk sold fell off owing to competition of natives of India who keep cows at Lashio, but there was realized a sum of Rs. 250 by sale of milk and butter and of Rs. 100 for calves. The cows have been milked only once a day instead of twice, and the calves have naturally benefitted much in consequence. It remains to be proved whether the cross-bred cows (half Australian) will be a success as milkers. On the whole the dairy has been successful. The sheep farm was not so successful as in 1891. Large numbers, especially of the Chinese sheep, died off on account of the heavy rains, and Mr. Hillier is now of opinion that the climate is not suitable for them: but the Superintendent of the Northern Shan States points out that the Madras sheep do better than the Chinese sheep, and the cross-breeds thrive very well. It is matter for regret that the Shans do not take to sheep-breeding.

The donkey stallion has been a complete failure. But the pony stallion has covered 140 mares since his arrival. The foals are said to be promising but somewhat leggy, but it is rather early as yet to judge of them.

It is unfortunate that the Shans take little or no interest in the operations of the farm, which is said to be due to there being no market for any grain but rice.

The expenditure on the Lashio Farm in 1892-93 amounted to Rs. 21,074, the principal items being as follows: Cooly labour Rs. 4,120, keep of live stock Rs. 2,720, salary of Superintendent and establishment Rs. 7,638. The receipts resulting from the sale of farm produce and stock amounted to Rs. 709 only.

Experimental cultivation in the Southern Shan States.

70. Experimental cultivation in the Southern Shan States has been continued during the year. The expenditure during the year is shown as Rs. 5,387-15-8, which includes an item of Rs. 2,596-10-9 for wheat given out to cultivators for experimental cultivation, while a sum of Rs. 2,523 was realized by the sale of wheat. The other disbursements were on the orchard Rs. 1,913-0-2, on the garden Rs. 285-15-9, and on potatoes Rs. 592-5-0, while the sale of garden produce realized Rs. 80-1-6 and that of potatoes Rs. 60. The Superintendent values the wheat in stock at Rs. 140, the Myelat potato seed in stock at Rs. 1,090, and the potato crop in the ground at Taunggyi at Rs. 2,870. These potatoes are in the orchard, where they were planted to keep the weeds down There were also in the orchard on the 1st June 1893 a number of English fruit trees,

71. Mr. Hildebrand, the Superintendent of these States, says that "the principle on which these experiments are based is to have no middleman or foreign labourer." All is "done by the local labourer, and nothing has been aimed at that he has not been able to accomplish." He finds that the villagers take to the cultivation of new crops or new varieties of crops already grown by them whenever they find that it will pay to do so, and that once the fact that a crop can be grown and will pay is established, its further cultivation may be left to the people. For instance, though the year 1891-92 was the first year that wheat was grown to any considerable extent, it is now so much appreciated by the people that Mr. Hildebrand anticipates that after this year its cultivation may be safely left to the people and it will be no longer necessary for Government to interfere. This is most satisfactory, and the conduct of these wheat experiments has been very much to Mr. Hildebrand's credit. It is very evident that he has taken great pains to procure the best sorts of seed and the season for sowing is carefully selected, but, what is equally important, he has contrived to get the villagers to take an interest in his operations.

72. It has been clearly established that the Sagaing wheat is not suitable for cultivation in the Southern Shan States, or at least in that portion of them in which the experiments were carried out. But the North-Western Povinces' soft white wheat has been a decided success. Of this wheat 13 baskets were sown and the outturn was 197 baskets, or fifteen-fold, whereas the Sagaing wheat yielded but little over four-fold.

73. The crop was sold last year at Rs. 8 the basket (105 lbs). It is anticipated that the crop of the current year will suffice for local requirements, *i.e.*, for the Commissariat at Fort Stedman. The price may fall somewhat, but even so it will be such a profitable undertaking that it will not be given up again.

74. The next most important experiment is that of potatoes, and that has been confined hitherto to the Myelat as the cart-road ended there, but now Mr. Hildebrand is trying potatoes in the orchard at Taunggyi. Potatoes were already grown in this tract, but it is desirable to introduce improved varieties. This is being done and the cultivators gladly take up the new seed. It is estimated that the total export of potatoes from the Myelat in the year was a lakh of viss (3,250 cwt.), and it is therefore satisfactory that the cultivators are taking to growing new and better varieties.

75. The vegetable garden has been most successful, and the Superintendent found various English vegetables in many places in the States.

76. The orchard promises well. Besides a large number of apples, pears, and peaches, the result of sowings made from indigenous seed, there are now growing the following trees obtained from India or England,—24 pear trees, 23 apple trees, 13 walnut trees, 14 peach trees, 4 cherries, 13 apricots, 18 vines, 2 mulberries, 6 figs, and a nectarine. A competent head gardener with an under-gardener is about to be procured from Ramghur in the North-Western Provinces and under his charge the orchard will probably succeed.

77. Experiments in wheat cultivation have also been undertaken in several districts in Upper Burma. Some seed was supplied to cultivators in Mandalay and in one case a crop of 456 lbs. was got for 50 lbs. of seed sown. Wheat was grown with excellent results in the Singu township, and the Deputy Commissioner reports that the area under wheat was three times as large as in the year before. In Kyauksè, too, the cultivation of wheat is rapidly extending. In Meiktila the cultivation of wheat has become "firmly rooted." Wheat seed (550 baskets) was supplied to the cultivators in Meiktila by Government. The Deputy Commissioner reports that this wheat for the most part failed as there was very little rain in the latter part of the season, and there was no water in the tanks for irrigation. But in some places the wheat did well owing to water being available, or the soil being damp, and an outturn of 2,000 baskets was obtained near the Meiktila lake and in villages adjoining the Natmyaung, so that after all the result of the experiment is in some measure encouraging. Ten baskets of wheat seed were supplied for cultivators in Katha. This experiment failed, the cultiva-

tors taking little interest in it; but the Subdivisional Officer at Mansi grew wheat successfully using as seed wheat procured through the military police. Wheat seed from Sagaing was also supplied for cultivation in Bhamo: there were cases of failure; but the Assistant Commissioner of Myitkyina reported that at that place the wheat was a great success. Two baskets of seed were sown in September on land that had not been irrigated or manured. The outturn was at the rate of 47 baskets the acre. From the Ruby Mines it was reported that a small quantity of good wheat had been grown at Möngmit. Wheat can no doubt be grown in all districts of the Southern division. In Minbu it is a regular crop and no experiments are required. A fair crop has been grown at the Taungdwingyi jail in Magwe and it is grown to a small extent in Myingyan and Pakôkku.

78. From time to time it is reported from different districts that wheat is successfully grown, but that there is no market for it. This is naturally the case at first where a grain that is not consumed by the people of the country is grown in out-of-the-way places in small quantities; but steps have been taken to bring the facts to the notice of grain merchants, and now that wheat-cultivation is extending they will doubtless find it to their advantage to purchase Upper Burma wheat.

79. There were also distributed for experimental cultivation in the year cotton potato, and vegetable seeds. In the Lower Chindwin beans, peas, and turnips were most successfully grown. In Shwebo the English vegetables were successful, where properly cultivated. Potatoes were sown in small quantities in several places in the Magwe district and failed as a rule. In some cases the plants looked well in December, but they were afterwards attacked by ants and other insects, and in no case were the potatoes dug up of good size. At Taungdwingyi from 7 lbs. of seed a crop of 26 lbs. was obtained, while at Yenangyaung from 6 lbs. of seed 14 lbs. of potatoes were procured; and the Subdivisional Officer is of opinion that potatoes will grow at Yenangyaung, but require more care than Burman cultivators will bestow on them. A small quantity of potato seed was supplied to Mr. Hirjee of Mandalay. His experiment failed owing to the seed being bad. English vegetable seeds were distributed for cultivation in Sagaing. The Subadar of Military Police at Sagaing and the Extra Assistant Commissioner at Myotha were very successful in their experiments. In Sagaing itself one of the clerks grew excellent peas, beans, lettuce, radish, and turnip, while his other vegetables did fairly well. There would no doubt be a good market for any such vegetables grown within reach of Mandalay.

80. American and Egyptian cotton-seed was sent for experimental cultivation in the Meiktila district and was tried in the Wundwin and Mahlaing subdivisions. It failed owing to drought, and, in one place, owing to flood when the plants were a few inches above the ground. Similar cotton-seed supplied in small quantity to Mr. Hirjee of Mandalay was quite a success and is, Mr. Hirjee considers, "infinitely superior to Burma cotton." His land under cotton was, however, irrigated from time to time.

81. Mr. Watson, who has had many years' experience in coffee planting, has lately written a note on the cultivation of Liberian coffee in Tavoy which has been published in the *Gazette* and in some newspapers. Some Liberian coffee planted by him has produced heavy crops, in a few cases he estimates as much as half a cwt. a tree, but that yield no doubt is exceptional. He estimates that the average yield is 8 viss (27 lbs) of cherry coffee to the tree and one viss (3·65 lbs) of clean coffee which sells in Tavoy at Rs. 2-8-0 the viss. The yield per acre he puts at 8 cwt. of clean coffee. Mr. Watson recommends as suitable for Liberian coffee land at an elevation between sea-level and 2,000 feet. When taken up for coffee, it should be covered with forest and have a rich, deep, friable soil. The land should be undulating and, provided it is well drained, a rainfall of as much as 200 inches may be of advantage: but in any case a heavy rainfall is required. Mr. Watson describes his mode of cultivation in considerable detail, giving accounts of the experience gained, as he says, as a pioneer. He has no doubt shown that coffee can be grown well in Tavoy, and it may be hoped that the planting industry there may develop, but, as elsewhere in Burma, the labour difficulty has to be faced.

Mergui garden.

82. The experimental garden was kept up during the year. The Liberian coffee plants have suffered from disease and it has not been considered advisable to give out any more plants from the garden, but 1,122 plants were planted out in the garden from the nurseries. The yield was something over 2,800 lbs. Arabian coffee has not yet been attacked by disease, but it has failed to fruit.

The vanilla is doing well and the tea fairly, while pepper is a failure though, as the Deputy Commissioner remarks, it does well at Renoung, south of Mergui. Cardamoms also are a failure:

The Assistant Conservator of Forests recommends that a larger grant be made for the garden, but the Deputy Commissioner thinks that what is required is rather an experienced gardener from the Straits. However, as it did not appear that there was any probability of any good results being obtained from keeping on the garden at Mergui, it has been decided now to discontinue the annual grant for its upkeep.

In 1892-93 the receipts from the sale of produce of the garden amounted to Rs. 193 and the expenditure to Rs. 819.

Agricultural shows.

83. Agricultural shows were held at Pegu, Thamaing (in Hanthawaddy district), Thônzè (in Tharrawaddy district), Moulmein, Salin (in Minbu district), and after the close of the year at Mingin in the Upper Chindwin.

The show at Pegu was a good one. The Deputy Commissioner remarks: "that the entries for cattle were numerous and the quality of the beasts exhibited good. The entries under the heading of wells, bunds, straw stacks, &c., though few in number, showed that care and trouble had been taken in their construction."

The show in Hanthawaddy was a decided success. It was held on the same day as a pagoda festival of Kyaukwaing so that there was a large gathering of people and exhibitors came from all parts of the subdivision.

The Tharrawaddy show was also held at the same time as a pagoda festival. The Financial Commissioner attended this show and after distributing the prizes, addressed the people explaining the objects with which these shows are held. Some good bunds and wells and an excellent fruit garden were awarded prizes. Thirty-nine pairs of cart and plough bullocks were shown among them being some very fine animals. Several non-official gentlemen served on the committee at this show.

At Moulmein the agricultural show was arranged by the Agri-Horticultural Society of Tenasserim, the Honorary Secretary of which (Mr. Peché) took great pains about it and the show was without doubt a success. Twenty-one head of cattle were entered which were on the whole of superior quality. There were also shown seventeen baskets of paddy and rice and some sessamum, tobacco, betelnut, vegetables, and fruit. It will certainly be advisable to accept the offer of the Society to arrange for next year's show and to hold it at the same time as their horticultural show.

The Deputy Commissioner of Minbu reports the Salin show to have been a decided success, animals being brought in from five townships, one of which is some 40 miles and another 50 miles from Salin. One hundred and forty-one pairs of bullocks were exhibited, many of them being very fine animals. Seventy-one ponies were exhibited. They were of very different qualities, but the number of entries is most satisfactory.

The Mingin show was also quite a success, but as it was held after the close of the year under report, it is unnecessary to give particulars about it here.

SECTION V.

CATTLE-BREEDING AND VETERINARY ESTABLISHMENTS.

84. The cost of the Civil Veterinary Establishment in the year was Rs. 35,157 which includes the salary of the Superintendent and that of the Assistant Veterinary Instructor, the allowances to the pupils, and the pay of the assistants.

85. Fifteen veterinary assistants were employed during the year, and although it is most desirable that a larger number should be engaged, none of the boys from the school are yet qualified for practical work. Of the 15 assistants, one has his headquarters in Rangoon, and there is one in each of the districts of the Pegu division; Thayetmyo and Bassein employ two each, and the other districts of the Irrawaddy division one each; there is one assistant in Arakan (Akyab district) and two in Tenasserim (Amherst and Toungoo), while one is in Mandalay. Several of these assistants were, however, temporarily sent to other districts to deal with outbreaks of disease, the assistants in Hanthawaddy, Rangoon, Thayetmyo, Prome, Tharrawaddy, and Toungoo being sent on duty to Upper Burma.

86. The total number of cases treated by the assistants is given as 8,161.* Of these 7,460 are reported as cures. One of the assistants in Thayetmyo and the Akyab assistant treated 3,204 animals between them, of which it is said that 3,113 were cured, and only 7 died, the result in 84 cases being unknown.

87. The number of cattle under treatment and reported to have died is in most cases very small, but in Bassein out of 1,005 animals treated 69 died, though both the veterinary assistants in that district are among the best: this heavy mortality is no doubt due to rinderpest and anthrax being very prevalent in Bassein in the year.

88. Of the total number of cases treated by far the largest number were for foot-and-mouth disease (6,128), and the number cured was high (5,792), while only 4 animals treated for this disease are known to have died. For rinderpest there were 228 treated and 93 are said to have been cured. Only 68 animals were treated for anthrax, of which it is said 39 were cured. For debility there were 331 treated, of which only 2 died, and for wounds 462 were treated, of which only 13 are known to have died. It is very satisfactory that such a large number of cases of foot-and-mouth disease were cured, though in Akyab some 3,000 head of cattle died from this disease. It is probable that cures in cases of rinderpest and anthrax can hardly be numerous.

89. The Superintendent of the Civil Veterinary Department reports that some of the assistants worked very well, and he specially brings to notice the conduct of Maung Tha Hme, who did excellent service on the occasion of an outbreak of foot-and-mouth disease in Magwe. That he was so successful when working in a strange district where he was unknown to the people is the more to his credit. The conduct of some assistants, however, was not satisfactory.

90. The Deputy Commissioners of Pegu and Tharrawaddy were not satisfied with the assistants employed in their districts, but the other two employed in the Pegu division did good work. The Deputy Commissioner of Toungoo reports that his veterinary assistant was "active and did good work during the year." In Akyab, too, the Deputy Commissioner was satisfied with the veterinary assistant. The Deputy Commissioner of Magwe remarks that both the subdivisional officer and the veterinary assistant were commended by the Financial Commissioner for their action when foot-and-mouth disease broke out at Taungdwingyi. The Deputy Commissioner of Yamèthin reports that an outbreak of foot-and-mouth disease was checked by the help of the veterinary assistant. On the whole much good work was doubtless done by these assistants, and it is most satisfactory that in districts to which they are new and where they are sent on special duty, the cultivators look for their assistance and show no prejudice against them.

91. Until the Burma Cattle Diseases Bill becomes an Act outbreaks of rinderpest and anthrax cannot be dealt with in a satisfactory way, but in some districts the people on being advised to follow the provisions of the Bill have not shown any disinclination to take the desired steps. In the Magwe district cattle were at once segregated on the outbreak of foot-and-mouth disease, and it is believed that the spread of the disease was thereby checked for the people cooperated most willingly. Again, in Bhamo the provisions of the Bill were as far as circumstances permitted carried out with the "universal consent of the villagers." In Mergui the villagers "willingly destroyed infected or suspected animals themselves without compensation."

* The cattle-death statistics are given in the Revenue Administration Report; those given by the Superintendent, Civil Veterinary Department, are incomplete, as he wrote his report before all the returns had been received.

The Superintendent, Civil Veterinary Department, makes the following remarks on the measures employed for dealing with cattle plague in this country :—

"On the receipt of news of an outbreak of disease, the veterinary assistant of the district is sent off without delay to the scene of the reported outbreak. After enquiry and inspection he reports to the Deputy Commissioner and my office what he has seen and done, whether the outbreak is severe or slight, and if he feels competent to deal with it without assistance. Should he consider there is too much for him to do I send him one, two, or more veterinary assistants from districts free from disease to render him every help in their power, and if the outbreak is severe I try to get away myself. As many as six assistants and myself were engaged in dealing with one large outbreak last season. The roads were watched; no cattle from affected parts allowed to enter certain markets without a veterinary certificate; all cattle for transit by train between certain stations mentioned by me had to be examined and if healthy passed and a certificate given before they were allowed to proceed; they were again examined on being detrained before being allowed to leave the station premises. * * My instructions to assistants are (*a*) to lose no time in saving the healthy cattle by segregation, dividing them into lots and removing them to other pasturage; (*b*) to segregate into a separate lot all cattle showing signs of ill-health for observation and to make morning and evening inspections, and (*c*) not to allow those men who have attended diseased cattle to go near the healthy and *vice versâ*."

These are the instructions given, but of course until the Cattle Diseases Act is passed they can only be carried out with the consent of the cattle-owners.

92. The Superintendent, Civil Veterinary Department, describes the work of the Veterinary school in his report. The progress made is on the whole satisfactory but, as remarked in last year's report, the pupils have no practical training which, as the Superintendent points out, leaves their instruction very imperfect. This will now be remedied, and good progress may be looked for. It will probably be advisable to admit some more pupils to the school as suggested by the Superintendent, and in any case it can hardly be expected that the requirements of the whole province will be supplied for a considerable time to come.

Breeding operations.

93. The cost of the stallions during the year was Rs. 3,320, there being 8 stallions, of which 5 were attached to police battalions in Upper Burma, and the other 3 were in Tharrawaddy, Prome, and Pyinmana districts. There was also a donkey stallion in Yamèthin, and 5 stallion colts in Rangoon. There were 126 mares covered and 39 foals were born, and a sum of Rs. 221 was realized in fees. The colts are doing very well and will shortly be distributed in different districts.

Police duties.

94. Surra was very prevalent among the police ponies in several districts of Upper Burma, the number of deaths from this disease being 478, of which over 200 occurred in the Bhamo district alone.*

SECTION VI.

AGRICULTURAL AND FISCAL STATISTICS.

95. It appears that in some districts no better care has been taken with the rainfall returns than in previous years. It was necessary to return for correction 15 of the district returns for July, August, or September, and in October the Director addressed all Commissioners on the subject and pointed out that, owing to these returns being incorrectly prepared, much needless work devolved on his office, while the submission of the provincial returns to the Meteorological Reporter was also delayed. He asked Commissioners to impress on Deputy Commissioners the necessity for accuracy, and he specially referred to errors in the returns for the following districts, namely, Bassein, Henzada, Prome, Shwegyin, Salween, Mandalay, Shwebo, Lower Chindwin, Yamèthin, Pakôkku, Myingyan, and Minbu.

Eight new rain-gauges were distributed in Burma in the year 1892-93, but since the close of the year a large number of new gauges have been sent out and new registering stations have been established.

96. The weekly crop reports are usually submitted punctually and are on the whole prepared with care. A considerable number of references has still, however, to be made to some Deputy Commissioners about these reports.

* Furthur particulars regarding the matters discussed in this section will be found in the annual report of the Superintendent, Civil Veterinary Department, which will be submitted with this report.

SECTION VII.

TRADE AND TRADE STATISTICS.

Trade registration.

97. Trade between Upper and Lower Burma was registered as in 1891-92 except that the river station at Toungoo was opened on the 1st May 1892 and discontinued on the 31st October of the same year, and the following new registration stations were opened :—

Allanmyo } Boat traffic.
Toungoo }

Allanmyo
Thayetmyo (two routes) } Road traffic.
Kyaukpadaung
Toungoo

It has been decided not to register the inland trade of the Town of Rangoon.

98. The registration of overland trade between Burma and adjoining countries was carried out as before. The number of registering stations was 7 instead of 5 in the previous year. The new stations opened were Pyawbwè and Pyinmana. The Hlaingdet station was transferred to Kywelebin and the Manaung station was moved to Myothit. In Lower Burma the number of stations was 5, the same as in the previous year, the only change being that the Kawkareik station was transferred to Tadanku.

99. The work of the trade department in the office of the Director of Land Records has been very carefully carried on by Mr. Claridge, the Head Assistant. Some of the returns have not been punctually compiled, but Mr. Claridge appears to have done all he could, and it will probably be necessary to increase the establishment.

Crop estimate.

100. An estimate was made as usual of the rice crop in Lower Burma and it was estimated in February 1893 that the amount of rice available for export would be 1,637,000 tons, or nearly 400,000 tons more than in 1892. The merchants appear to think that the estimate is too high, but it is believed that it will turn out that the estimate made by the Director was not inaccurate. At the end of July the exports exceeded those of 1892 up to the same date by more than 100,000 tons, and the 1893 season is a late one, whereas the grain came in very early in 1892, prices having in that year been very high indeed, whereas in 1893, with a fall of 40 per cent. more or less in prices, cultivators and traders in the districts have held back the grain as much as possible. Stocks outstanding are large, and if there is a good demand in the remaining months of the year, the exports will not fall far short of the amount estimated to be available.

SECTION VIII.

101. Mr. Wilson was in charge of the department during the year except in the interval between the 17th April and the 31st July 1892 when he was on leave. Mr. Mathews officiated for him at this time.

Mr. Ford, Superintendent of Land Records, was on privilege leave from the 28th March to the 22nd May 1892. Maung Po So, Inspector, officiated for him.

Maung Shwe Gyôk was on privilege leave from the 9th September to the 24th November 1892, when Maung Kyi O, B.A., probationer, officiated for him, being transferred from Bassein to Prome for that purpose.

None of the other Superintendents were absent during the year nor were there any transfers. When supplementary survey was started in Thayetmyo, Mr. Wood, probationer, was placed in charge under the Superintendent of Prome. The other two probationers, Maung Kyi O and Maung Pe Maung, were employed in Prome and Thôngwa during the year.

W. T. HALL,
Offg. Director.

The 28th August 1893.

G. B. C. P. O.—No. 7175, D., L. R. & A., 29-11-93—380.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1893-94.

RANGOON: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, BURMA. NOVEMBER 1894.

{ Price,—Re. 0-10-0. }

TABLE OF CONTENTS.

REPORT ON THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BURMA, FOR THE YEAR 1893-94.

	Para.	Page.
SECTION I.		
Contents of Section I ...	1	1
Number of survey schools	2	ib.
School fees	3	ib.
Attendance	4	ib.
Qualification for admission to survey schools	5	ib.
Rules regarding tuition	6	2
Scholarships	7	ib.
Examinations	8	ib.
Accommodation	9	3
Inspections of survey schools	10	ib.
Appointments to the public service	11	ib.
Training with Survey of India parties	12	ib.
Cost of survey schools ...	13	4
SECTION II.		
ANALYSIS OF DISTRICTS WITH REFERENCE TO SECURITY AGAINST FAMINE.		
Principles of analysis ...	14	4
Districts from which analyses were received ...	15	ib.
LOWER BURMA.		
Surplus food-supply available in Lower Burma	16	4
Arakan division	17	ib.
Pegu division	18	ib.
Irrawaddy division	19	5
Tenasserim division	20	ib.
UPPER BURMA.		
The food-supply of Upper Burma...	21	5
Mandalay district	22	7
Bhamo district	23	ib.
Katha district	24	ib.
Ruby Mines district	25	ib.
Shwebo district	26	ib.
Ye-u district	27	ib.
Sagaing district	28	8
Lower Chindwin district	29	ib.
Upper Chindwin district	30	ib.
Thayetmyo district	31	ib.
Pakôkku district	32	ib.
Minbu district	33	ib.
Magwe district	34	ib.
Kyauksè district	35	9
Meiktila district	36	ib.
Yamèthin district	37	ib.
Myingyan district	38	ib.
Estimate of persons requiring relief in event of famine and provision of relief works	39	ib.
Rainfall and Harvest.		
Arakan division	40	10
Pegu division	41	ib.
Irrawaddy division	42	ib.
Tenasserim division	43	ib.
Northern division	44	ib.
Central division	45	ib.
Southern division	46	11
Eastern division	47	ib.
Prices.		
Rangoon ...	48, 49	11
Arakan division	50	12
Pegu division	51	ib.
Irrawaddy division	52	ib.
Tenasserim division	53	ib.
Northern division	54	ib.
Central division	55	13
Southern division	56	ib.
Eastern division	57	ib.

SECTION III.

Fodder Reserves and Arboriculture.

	Para.	Page.
Fodder reserves	58	13
Arboriculture	59	ib.

SECTION IV.

Agricultural Experiments.

Experimental cultivation in the Northern Shan States—The Lashio farm	60	13
Failure of the Lashio farm	61	14
Experimental cultivation in the Southern Shan States	62	ib.
Mr. Hildebrand's experimental orchard and garden	63, 64	ib.
Wheat cultivation, Southern Shan States	65	ib.
Potato cultivation, Southern Shan States	66	ib.
Wheat cultivation, Upper Burma	67, 68	15
American maize	69	ib.
American tobacco	70	ib.
English vegetable seeds	71	ib.
Reports regarding results of experiments	72	ib.
Agricultural shows	73	ib.
Programme for future agricultural shows	74	ib.
Expenditure on agricultural shows, &c.	75	16
Kyônpyaw show	76	ib.
Moulmein show	77	ib.
Mingin show	78	ib.

SECTION V.

Cattle-breeding and Veterinary Establishments.

Cost of Veterinary Department	79	17
Junior Veterinary Assistants	80	ib.
Superintendent and Senior Assistant	81	ib.
Pony-breeding	82	ib.
Mule-breeding	83	ib.
Veterinary school	84	ib.

SECTION VI.

Agricultural and Fiscal Statistics.

Rainfall statistics	85	17
Crop reports	86	18
Monthly food-supply notes	87	ib.
Fortnightly statements of retail prices	88	ib.
Normal prices of food-grains	89	ib.

SECTION VII.

Trade and Trade Statistics.

Internal trade registration	90	18
External trade registration—Number of stations	91	ib.
Alterations in system of registration	92	ib.
Trade registration establishments	93	19
Rice-crop estimates	94	ib.

SECTION VIII.

Personnel of the Department.

Director	95	19
Superintendents	96	ib.
Probationers	97	ib.

APPENDICES.

	Page.
Statement I.—Report on experimental cultivation in the Southern Shan States for 1893-94...	iii.
Statement II-A.—Distribution list of seed obtained for experimental cultivation during 1893-94	xv.
Statement II-B.—Statement showing description and quantity of seeds received together with the cost of consignment and of distribution during 1893-94 ...	ib.
Statement III-A.—Experimental cultivation—American maize	xvi.
Statement III-B.—Experimental cultivation—American tobacco seed distribution ...	xvii.
Statement III-C.—Experimental cultivation—English vegetable seeds—Seed distribution ...	ib.
Statement III-D.—Experimental cultivation—Wheat	xviii.
Statement III-E.—Experimental cultivation—Potatoes	ib.
Statement IV.—Agricultural shows—Prize list	xix.
Statement V.—Schedule of normal prices of food-grains per 100 9-gallon baskets for each month of the year excluding abnormally high or low prices	xx.
Statement VI.—Annual Famine Statement C for Burma for the year 1893-94	xxi.
Statement VII-A.—General statistics relating to Government Survey Schools for the official year 1893-94	xxii.
Statement VII-B.—Results of Survey Examinations from October 1892 to April 1894 inclusive	xxiv.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1893-94.

SECTION I.

Contents of Section I.

THE parts of this section dealing with the maintenance of land records and survey have been introduced into the Revenue Administration Report. The following paragraphs on the subject of survey schools have, however, been inserted here.

Number of survey schools.

2. There were 20 survey schools open at the close of the year, 12 being in Upper and 8 in Lower Burma. Statement VII-A of the appendices gives information regarding the position of the schools, the districts served by each, the number of pupils, the distribution of scholarships, and other details. New schools were opened during the year at Tavoy, Shwebo, Thayetmyo, and Meiktila. The Kyaukpyu school, which had been transferred to Sandoway experimentally in 1892, was during the year re-transferred to Kyaukpyu. All the schools are now Government institutions. The Toungoo school, which belonged to the Toungoo Municipality, was for want of funds closed in March 1892, but was very shortly afterwards re-opened as a Government school.

School fees.

3. The rate of school fees leviable from the students in the Pegu and Irrawaddy divisions is Rs. 2 per mensem, while the rate is Re. 1 per mensem elsewhere. Out of the total number of pupils attending the schools at the end of the year 6 per cent. in Lower Burma, and 41 per cent. in Upper Burma, were free pupils exempted from the payment of fees. These exemptions are made, under the rules, to the sons of thugyis and to the cadets of thugyi families. Fees were not in all cases collected with promptitude. Under Director's Circular No. 9 of 1892 fees have to be paid in advance, but school teachers are very slack in enforcing compliance with this order, Thayetmyo and Pegu being most dilatory in this respect. The total amount of the fees collected during the year was Rs. 4,926, of which Rs. 3,686 were contributed by the schools of Lower Burma and Rs. 1,240 by Upper Burma.

Attendance.

4. The attendance during the year was fair. The average daily number of pupils on the rolls was 347 and the average daily attendance was 304. The schools showing the greatest irregularity of attendance were Kyaukpyu, Minbu, and Thayetmyo, but several others were also very slack. The gradual abolition of the taikthugyi system to some extent reduced the attendance. Most youths taking up survey work have been in the habit of looking forward to a chance of a comfortable circle thugyiship, and when it was understood that no new appointments would be made, the number of students naturally fell off. The demand for surveyors is, however, so large that the prospects of getting early employment are sufficient to attract a steady flow of students, and, unless this flow is stopped by the new rules regarding qualifications for admittance, there is never likely to be a want of passed surveyors when they are required.

Qualification for admission to survey schools.

5. Since the 1st April 1894 a new rule requiring Seventh Standard Examination passes from all candidates for admission to survey schools has been introduced, with the proviso that the Financial Commissioner may authorize the acceptance of a lower qualification in cases where enforcement of the new rule

would destroy the usefulness of the school. The result of these new rules will form a subject for discussion in next year's report after the rules have received a fair trial, but it may be mentioned that Deputy Commissioners are all in favour of a return to the lower qualification. There is little doubt that the new rules give a premium to the town-bred sons of traders and others at the expense of the less highly educated relations of the agriculturist and village headmen. This is a serious matter, as the smooth working of the village system requires a close touch between the surveyor, the headman, and the cultivator. Again, with country-bred surveyors, educated in the village schools, it should be possible to reduce salaries, and, by reducing the cost of survey, to increase the funds available for the remuneration of the headmen.

Rules regarding tuition.

6. In order to prevent interference with the progress of tuition, rules have been issued in the form of a circular (No. 7 of 1894) prohibiting admissions during the latter half of a term. It was found that these late admissions retarded the progress of students who entered earlier and had already made some headway. The same circular also prescribed the division of schools into senior and junior classes and laid down the subjects to be taught in these classes. It also required that promotion from class to class, and candidature for Syndicate examinations, should only be allowed to students successful at periodical school examinations.

Scholarships.

7. Under the survey class scheme 78 scholarships were allotted to Lower and 70 to Upper Burma. At the close of the year there were 43 scholarship-holders in the schools of Lower Burma and 35 in Upper Burma. The total amount paid during the year on account of scholarships was Rs. 9,469, of which Rs. 4,743 related to Lower and Rs. 4,726 to Upper Burma. These scholarships were tenable for one year at the rate of Rs. 10 per mensem, and in order to increase their usefulness it was decided to increase their number. This increase was obtained by making two grades of scholarships, the first of the value of Rs. 120 or Rs. 10 per mensem, as before, the second of the value of Rs. 60 or Rs. 5 per mensem. The following statement compares the distribution of scholarships under the old and new rules :—

Division.	Old Rules. Scholarships, value Rs. 10.	New Rules (introduced from 1st April 1894). Scholarships, value Rs. 10.	Scholarships, value Rs. 5.	Total.
Lower Burma—				
Arakan	12	6	10	16
Pegu	22	10	22	32
Irrawaddy	24	10	22	32
Tenasserim	20	10	18	28
Total ...	78	36	72	108
Upper Burma—				
Northern	15	6	16	22
Central	15	6	16	22
Southern	15	8	16	24
Eastern	25	12	24	36
Total ...	70	32	72	104
Grand Total ...	148	68	144	212

Of these scholarships only half the total number can be allotted in any half year. Under ordinary circumstances a newly joined student, entitled to a scholarship by virtue of his claims to a thugyiship or by his poverty, would receive a second-grade scholarship, and would only obtain a first-grade scholarship by steady work and good conduct. Power has, however, been reserved enabling Deputy Commissioners to allot first-grade scholarships immediately on admission where they appear to be deserved.

Examinations.

8. In previous years examinations for survey school certificates in Upper Burma were conducted by special officers, but in the year under report the Educational Syndicate examinations were extended to Upper Burma. The results of the examinations

held during the last two years are given in Statement VII-B of the appendices. The total number of passes obtained from Government survey schools was 204 at the last two examinations as compared with 305 passes at the examinations of October 1892 and April 1893. This very unsatisfactory falling off was chiefly noticeable at the examination held in April 1894, when the number of passes obtained in Lower Burma was extraordinarily low. The schools showing the worst results are those of Moulmein, Akyab, Tharrawaddy (acting teacher), Tavoy, Yamèthin, and Hanthawaddy. In the case of Tavoy the teacher has since been removed for incompetence, while the other teachers have been warned that they will be removed or reduced unless they display more energy and are more successful. The most popular and successful schools are those of Bassein, Ma-ubin, Toungoo, and Minbu, all of which have got excellent teachers.

Accommodation.

9. All the survey schools are now accommodated in Government buildings, with the exception of Akyab, Bassein, Shwebo, and Toungoo. In the first three cases private buildings are rented for the accommodation of the schools, and in the last the school is held in a Municipal building, which was allotted to the school before the Municipality transferred its control to Government. The Hanthawaddy (Rangoon) school accommodation is insufficient, but it will do for the present as it has been decided to shift the school out to Insein, where open land for practising surveying will be available, and where it will be possible to keep the students out of mischief. The accommodation at Tavoy is insufficient and it may be necessary to rent a building for the use of the school. In Minbu the school building is a good one, but it is too far from the Deputy Commissioner's office.

Inspections of survey schools.

10. All survey schools, with one exception, were during the year inspected by the Officiating Director or by Mr. Clancey. The one exception was the newly opened school at Shwebo, which will be inspected very shortly. Five of the schools were inspected twice. At each inspection the students were examined both in field work and indoor studies.

In Akyab and Prome inspection showed want of practice in field work. In Kyaukpyu, Hanthawaddy, Pegu, Tharrawaddy, Bassein, and Henzada the students showed up fairly well. In Moulmein the students were found to be backward, while in Tavoy the tuition was distinctly defective, and in Toungoo field work was not up to the mark. The Meiktila, Sagaing, Kyauksè and Minbu schools showed that the students were carefully trained, but in the last case some of the field work was carelessly done. The Thayetmyo school inspection indicated insufficient training in field work, and the work of the teachers in this school and in Yamèthin was not up to the mark. The Deputy Commissioners of Kyauksè and Sagaing visited their schools frequently and took an interest in them. Where there are Superintendents of Land Records, these officers are required to exercise a close supervision over the schools. As a rule this duty is conscientiously performed, but more test examinations should be held, as these smarten up both students and teachers and reveal any weakness in the system of tuition.

Appointments to the public service.

11. During the year under report 99 passed students obtained employment under Government; of these 41 belonged to Lower Burma schools and 58 to Upper Burma. The demand for passed students was smaller than usual, as vacancies were to a great extent filled up by the appointment of qualified surveyors thrown out of employment by the closing of the local special survey offices.

Training with Survey of India parties.

12. The scheme under which Burmans and Karens were trained in Survey of India parties for a period of five years in order to qualify for certificates of proficiency in surveying is to be abolished, but the succeeding scheme is not yet in operation. This new scheme provides that holders of Syndicate survey school certificates who join Survey of India parties may obtain complete certificates after a training of two years. These complete certificates will give them a first claim on appointments as thugyisayes, revenue surveyors, &c.

Cost of survey schools.

13. The total cost of survey schools amounted to Rs. 34,940. Deducting from this the amount realized by fees, fines, &c., the net cost for the year is found to be Rs. 29,948, or Rs. 1,497 per school. The average cost of educating each pupil averages Rs. 86, being Rs. 80 in Lower Burma and Rs. 96 in Upper Burma.

SECTION II.

ANALYSIS OF DISTRICTS WITH REFERENCE TO SECURITY AGAINST FAMINE.

Principles of analysis.

14. The principles governing the system of analysis against famine, as laid down by the Government of India, have been embodied in the Financial Commissioner's note dated the 15th March 1892. This note has been introduced as Appendix XVI into the draft revised Famine Code now under the consideration of the Government of India. In section 3 of the same code it has been laid down (subject to the approval of the Government of India) that under ordinary circumstances the analyses shall be revised every third year, but provision has been made for annual revision in districts whose conditions are rapidly changing.

15. During 1893-94 the analyses, drawn up in terms of the Financial Commissioner's note, were received from the districts marginally noted, the analyses of Pakôkku and Minbu having been already received during the previous year. The analyses when received were scrutinized by the Director and, after submission to the Financial Commissioner, were returned to the respective district officers for amendment in the light of the Financial Commissioner's remarks and on the model of the Pakôkku analyses. After final amendment and check by the district officers, the analyses were printed and bound up for facility of reference. These analyses are, however, by no means perfect, and in view of the numerous defects which are still apparent, it has been decided to require their thorough revision in 1894-95.

Tharrawaddy.	Upper Chindwin.
Prome.	Lower Chindwin.
Mandalay.	Thayetmyo.
Shwebo.	Magwe
Katha.	Kyauksè.
Bhamo.	Meiktila.
Ruby Mines.	Yamèthin.
Ye-u.	Myingyan.
Sagaing.	

LOWER BURMA.

Surplus food-supply available in Lower Burma.

16. In Lower Burma the rainfall is practically certain, and the enormous area planted with rice is sufficient not only to feed the population, but to furnish a large surplus which is available for exportation. This surplus under ordinary conditions amounts to about ·25 tons per acre, and even in an unfavourable season it is not less than ·22 tons per acre. All the districts, with the exception of Sandoway, Arakan Hill Tracts, Rangoon Town, Thayetmyo (now belonging to the Southern Division of Upper Burma), Mergui and Salween, ordinarily contribute to this surplus. Of these excluded districts Sandoway and Mergui sometimes export, but as a rule they grow sufficient for local consumption and no more.

Arakan Division.

17. In the Kyaukpyu and Sandoway districts of the Arakan Division there are tracts in which the crops are liable to slight failure. Failure of this kind, combined with the impossibility of importing food at certain seasons of the year when communications are bad, has been known to produce scarcity (see paragraph 9 of last year's report); and in view of this fact, analyses of these districts are now being called for. The Arakan Hill Tracts and Akyab are considered to be perfectly secure.

Pegu Division.

18. In the Pegu Division the only precarious tracts are situated in Tharrawaddy and Prome. In the former district five circles of the Tapun township are classed as being only partially secure, the remaining 27 circles being considered as perfectly safe. The irrigation works, of which mention was made in last year's report, are still

under consideration. In the Prome district the precarious tracts are larger, an area of some 60,000, acres, or 19 per cent. of the total cultivated area, having been classed as insecure and a still larger tract as only partially secure. Failure of crops in this district is not likely, except in cases of exceptional drought, and revision of this analysis is now being put in hand.

Irrawaddy Division.

19. Excluding Thayetmyo, which formerly belonged to the Irrawaddy Division, all the districts of that division are classed as secure and absolutely free from danger of scarcity. Areas along the river are occasionally damaged by floods, but such damage is so infrequent and so limited that the affected tracts cannot be regarded as anything but secure.

Tenasserim Division.

20. Failure of crops and consequent scarcity is practically unknown on the plains of the districts in the Tenasserim Division, but in the hills failure and scarcity are possible under the same conditions as were described in the cases of Kyaukpyu and Sandoway (see paragraph 11 of last year's report). All six districts of the division were formerly classed as secure, but analyses will now be prepared with the object of classifying and determining their doubtful tracts.

UPPER BURMA.

The food-supply of Upper Burma.

21. The following statement has been compiled from the statistics of internal and external trade with the object of showing the extent to which Upper Burma is dependent for its food-supply upon outside sources. From the figures tabulated it is seen that in 1892-93 the Upper Province imported $4\frac{3}{4}$ million maunds of food-grains, pulses, and provisions, and exported only about $\frac{11}{20}$ million maunds, leaving a balance of $4\frac{1}{5}$ million maunds which was imported to make up deficiencies in the local supply. The harvest of 1892-93 was a poor one in Upper Burma, and followed on the disastrous season of 1891-92, when the crops failed entirely over large tracts. The figures for the following year show the effect of improved agricultural conditions and a good harvest. These causes reduced the imports of 1893-94 to $3\frac{1}{4}$ million maunds, while the exports increased to $\frac{3}{4}$ million maunds and left a deficit of only $2\frac{1}{2}$ million maunds, against $4\frac{1}{5}$ million maunds in the previous year.

Statement showing direction of trade in the principal food-grains, pulse, and provisions.

Year.	Description.	Brought into Upper Burma			Taken out of Upper Burma			Balance		Net total of food-grains, &c., brought into Upper Burma.	Remarks.
		From Lower Burma.	From foreign countries.	Total.	To Lower Burma.	To foreign countries.	Total.	Brought into Upper Burma.	Taken out of Upper Burma.		
		Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	
1892-93.	Wheat	67,785	160	67,945	5,513	...	5,513	62,432	...	...	
	Paddy	977,751	...	977,751	1,978	4,287	6,265	971,486	...	...	
	Rice	3,055,310	658	3,055,968	1,630	46,033	47,663	3,008,305	...	...	
	Jowar and bajra	5	...	5	5,407	...	5,407	...	5,402	...	
	Gram and pulse ...	39,157	87	39,244	437,320	193	437,513	...	398,269	...	
	Other grains and pulse ...	13,102	8	13,110	2,358	...	2,358	10,752	...	...	Maize, barley, and oats.
	Ghi	17,970	13	17,983	80	...	80	17,903	...	...	
	Dried fruits and nuts ...	90,941	623	91,564	223,634	15,358	238,992	...	147,428	...	Onions, garlic, potatoes, dates, tamarind, &c.
	Other provisions ...	790,708	42,784	833,492	81,219	86,649	167,868	665,624	...	...	Ngapi, salted or dried fish, flour, biscuits, butter, condensed milk, pickled tea, &c.
	Total ...	5,052,729	44,333	5,097,062	759,139	152,520	911,659	4,736,502	551,099	4,185,403	
1893-94.	Wheat	13,178	4,477	17,655	54,584	...	54,584	...	36,929	...	
	Paddy	1,142,343	...	1,142,343	10,825	135	10,960	1,131,383	...	...	
	Rice	1,563,011	3,111	1,566,122	5,258	39,995	45,253	1,520,869	...	...	
	Jowar and bajra	...	...	...	...	..	...	...	...	...	
	Gram and pulse	21,485	697	22,182	606,787	382	607,169	...	584,987	...	
	Other grains and pulse ...	10,967	...	10,967	10,155	...	10,155	812	...	...	Maize, barley, and oats.
	Ghi	16,004	215	16,219	162	60	222	15,997	...	...	
	Dried fruits and nuts ...	83,097	425	83,522	221,794	15,688	237,482	...	153,960	...	Onions, garlic, potatoes, dates, tamarind, &c.
	Other provisions	768,525	45,174	813,699	47,147	104,675	151,822	661,877	...	...	Ngapi, salted or dried fish, flour, biscuits, butter, condensed milk, pickled tea, &c.
	Total ...	3,618,610	54,099	3,672,709	956,712	160,935	1,117,647	3,330,938	775,876	2,555,062	
	Increase or Decrease ...	−1,434,119	+9,766	−1,424,353	+197,573	+8,415	+205,988	−1,405,564	+224,777	−1,630,341	

22. In the Mandalay district the tracts shown as perfectly secure are those protected by the Shwetachaung canal and the lakes east of Mandalay. A great portion of the district is classed as being secure except in years of extraordinary drought. Much is still required in the shape of irrigation works, but the schemes under consideration are so expensive that they are not likely to be carried out. Rupees 7,887 were advanced to agriculturists for purchase of cattle and seed during the year. The advances are appreciated, but the Commissioner is inclined to doubt their utility, as they do not produce permanent improvements and are generally expended on the purchase of cattle and seed. As was pointed out in last year's report, however, these advances, when made with care and discretion, result in bringing increased areas under cultivation, and have already extended the cultivation of wheat.

Mandalay district.

23. In Bhamo the rainfall is heavy and there is little danger of drought in ordinary years. A small tract near the town of Bhamo has been classed as secure. In the Kaungtôn, Shwegu, and Mogaung townships, where crops are more liable to frequent failure, there are some insecure tracts, but over the greater portion of the district failure can only occur under very exceptional circumstances. There are no irrigation works in the district. Advances, amounting to Rs. 5,670, were made to agriculturists and are said to have been beneficial.

Bhamo district.

24. The crops over the greater portion of the Katha district have been classed as secure except in years of extraordinary drought. The rainfall is heavier than in Shwebo, but it is not always sufficient. In Kawlin, near the border of the Shwebo district, a tract has been classed as insecure, while the only tract which is apparently absolutely secure from failure of crops is an irrigated area in Mawnaing. An extension of the Kunbaing canal system has been recommended by the Deputy Commissioner. Rupees 3,986 were advanced to agriculturists with, it is said, beneficial results.

Katha district.

25. In the Ruby Mines district the crops of the Mogôk township appear to be secure from failure. In the Twinnge township they are insecure, but throughout the rest of the district failure of crops is not ordinarily to be anticipated. There are no irrigation works in the district and, except in the Tagaung subdivision, they are probably not required. Rupees 12,340 were advanced to agriculturists. The benefits derived from these advances will doubtless be great if, as is hoped, they produce extension of cultivation and reduction in the local prices of food-grains, which are now very high.

Ruby Mines district.

26. The rainfall in Shwebo is light and uncertain and over a large portion of the district there is no security for the crops under present conditions. Restoration and improvement of old irrigation works will prove an immense benefit in this district and will remove the anxiety which a scanty rainfall invariably creates. The areas classed as secure, except during periods of exceptional drought, are partially protected by irrigation works, which are, however, to a great extent dependent on the local rainfall. No portion of the district is classed as absolutely secure from failure of crops. A large sum, over a lakh of rupees, was spent during the year on irrigation works, and it is believed that revision of analyses will show an improvement in the condition of the district. Rupees 16,380 were advanced to agriculturists during the year. The advances were without doubt required as the people suffered considerably during the scarcity of 1891-92.

Shwebo district.

27. A large portion of the Ye-u district is classed as insecure, and the rest as only partially secure. A number of irrigation schemes have been included in the famine programme, and there is no doubt that some of them should be pushed. The Commissioner is of opinion that the question of irrigation is of pressing importance, but, in view of the small population, he is averse to the commencement of new and costly works, and recommends the repair and improvement of old tanks, &c. at present out of repair. Only Rs. 4,300 agricultural advances were made during

Ye-u district.

the year. These advances were made for the purchase of plough cattle and are said to have been very beneficial.

Sagaing district.

28. In the Sagaing district there are considerable low-lying areas along the Irrawaddy and Chindwin rivers in which the annual rises of the river ensure the crop. The partially secure tracts are higher, but have a fairly fertile soil and some small irrigation works. Under the head of insecure are included the dry, sandy, or stony uplands entirely unprotected by irrigation works of any kind. Some petty repairs to irrigation works were carried out during the year, but no new work was attempted. Rupees 2,800 were advanced to ordinary cultivators during the year and Rs. 1,000 to a native of India grantee.

Lower Chindwin district.

29. Only a small area of the Lower Chindwin district is considered as being perfectly secure from failure of crops. This area is protected by small irrigation works. The tracts classed as partly secure are high lands with fairly fertile soil and lands obtaining some uncertain irrigation from the Chindwin river. Insecure tracts consist of high uplands with poor soil and depending for a crop entirely on an uncertain rainfall. Irrigation works are badly wanted. No agricultural advances were made during the year. The people appear to have recovered from the hard times of 1891-92 and to have sufficient seed and cattle to carry on their cultivation.

Upper Chindwin district.

30. A detailed analysis of the Upper Chindwin district has been drawn up. The tracts classed as secure are situated on the banks of the Chindwin river. There seems, however, to have been some confusion of ideas in drawing up this analysis. The classification should be one dependent entirely on the security or otherwise of the crop, but from an explanatory letter received from the Deputy Commissioner, it appears to have been partially determined by the other resources of the population. There are practically no irrigation works in the district. Rupees 4,000 were given out as agricultural advances.

Thayetmyo district.

31. Revision of the analysis of the Thayetmyo district is now being put in hand. No irrigation works were carried out during the year, but there are several works which would be useful. No agricultural advances were made.

Pakôkku district.

32. The greater portion of the Pakôkku district is classed as insecure. The islands on the Irrawaddy river, a large tract in the Myaing township, and some isolated patches, more or less protected by streams, are classed as partially protected. Tracts irrigated or inundated from the Myittha, Maw and Yaw rivers, or from perennial streams running from the Chin Hills, have been classed as secure. The irrigation works in the district are managed by the people themselves. Agricultural advances to the extent of Rs. 4,500 were made during the year as against Rs. 15,690 in the previous year. The Deputy Commissioner considers that the advances have been beneficial in keeping the people out of debt.

Minbu district.

33. In the Minbu district large tracts of irrigated land have been classed as perfectly secure. Other tracts on the borders of the irrigated area, or where the cultivation depends on the rise of the river, are classed as partially secure. The irrigation systems are extensive, but are capable of improvement. Some Rs. 32,000 was during the year collected and expended on the upkeep of these works. Rupees 17,950 were distributed in the form of agricultural advances for the purchase of seed-grain and cattle.

Magwe district.

34. The greater part of the Magwe district is classed as insecure. There are a number of small irrigation works which are more or less out of repair. Some of the larger works will require professional skill for construction, but on the Sunchaung the Deputy Commissioner is of opinion that, with some supervision, it would be quite possible for the people to carry out the works themselves. Agricultural advances to the extent of Rs. 2,320 were made to cultivators for purchasing cattle.

Kyauksè district.

35. The crops over the greater portion of the Kyauksè district are protected by an excellent system of irrigation works and are secure from possibility of failure. Beyond the limits of these tracts, which always obtain a sufficiency of water, are areas which are only imperfectly supplied and which have consequently been classed as only partially protected. Improvement of old irrigation channels and extensions of the system will without doubt secure these doubtful areas and render them proof against failure. A number of unirrigated villages where paddy is not grown and where only dry crops are obtained have been classed as insecure. Considerable sums were spent on the maintenance and improvement of irrigation works during the year, and when the system devised for annually clearing and deepening the distributory canals has been perfected, every year should show some advance. No agricultural advances were made during the year.

Meiktila district.

36. The whole of the Meiktila district has been classed as insecure with the exception of the villages lying close under the larger and more certain irrigation works. These villages have been classed as secure in ordinary seasons, but not in seasons of prolonged drought. Much has been done in this district on irrigation works, and during the year some Rs. 98,000 were spent on improvements and repairs. In revising the analysis of this district it should now be possible to classify some of the tracts protected by the existing works as absolutely secure. No agricultural advances were made during the year.

Yamèthin district.

37. In the Yamèthin district the greater portion of the Yamèthin subdivision has been classed as insecure. The crops on comparatively small areas protected by tanks, of which the Nyaungyan and Kyauksè tanks are the principal, have been considered as partly secured, while the only area in which there is absolute security of crops is a limited tract watered by perennial streams near the Sinthechaung. In the Pyinmana subdivision, a continuation of the Sinthechaung tract is also classed as secure. The rainfall in this portion of the Yamèthin district is much heavier than farther north, and it has therefore been possible to place the greater portion of the subdivision in the tract of which the crops are ordinarily safe. An extensive area, mostly of high land on the northern border of the subdivision, however, falls into the insecure tract where crops are liable to failure unless the rainfall is exceptionally good.

Considerable sums were spent on the restoration and repair of existing irrigation systems, and projects for a number of new irrigation works are under consideration and have been entered on the programme of relief works. Rupees 1,06,400 were advanced to agriculturists during the year, a sum of Rs. 19,940 advanced during the previous year being also shown in the accounts of the year. Of this large amount, about Rs. 50,000 was advanced to persons removed from hill clearings within areas taken up for forest reserves. These advances were made for purchase of cattle with the object of inducing these people to take to ordinary cultivation in the plains.

Myingyan district.

38. Nearly the whole of the Myingyan district has been classed as insecure. The exceptions are a riverine tract bordering on the Irrawaddy and classed as secure in ordinary seasons, and two small areas in the Myingyan and Salè townships where the crops are always secure. The importance of restoring the old irrigation tanks and reservoirs of this district was commented on by the Financial Commissioner when he visited this district during the scarcity time in 1892, and a number of these works have been entered on the district programme of relief works. Rupees 4,000 was advanced to agriculturists for the purchase of seed during the year.

Estimate of persons requiring relief in event of famine and provision of relief works.

39. Statement VI of the Appendices is the provincial statement showing the number of persons for whom it was in 1893-94 estimated that relief might be required in the event of serious famine. The same statement also shows the provision made in the district programmes of relief works to meet calls for employment at times when measures of relief are necessary.

Rainfall and Harvest.

Arakan Division.

40. The Arakan Division was favoured with abundant and timely rain. In *Akyab* and *Kyaukpyu* the season was not marred by the heavy showers which in 1892-93 damaged the ripening grain. The crop in the former district was a bumper one like that of the previous year, while in the latter an excellent crop was spoilt by a cyclone, the average outturn of the district being 15-annas only. *Sandoway* enjoyed a heavy rainfall in excess of that of the previous year, and a 16-anna crop was in consequence obtained. In *Northern Arakan* the rainfall was exceptionally heavy and the harvest was a good one.

Pegu Division.

41. In *Hanthawaddy* the rains commenced well, but there were breaks in the middle of the season when the rains should have been heavy, and the final or ripening showers were also absent, the rice crop in consequence averaging only 15 annas. In *Pegu* the rainfall was timely and sufficient until towards the end, when the sudden cessation of the final showers had a very unfavourable effect on the rice harvest, which was considerably below the average. In *Tharrawaddy* the rains were in places sufficient, but not in others. In this district also the final rains were not a success, an anticipated outturn of 18 annas being finally reduced to 15 annas. The rainfall in *Prome* was timely and well distributed, the tracts which ordinarily suffered from want of rain getting a better supply than usual, with the result that a 17-anna crop was reaped.

Irrawaddy Division.

42. *Thôngwa* received a normal share of rain, which was fairly well distributed, and although the closing showers were scanty, the harvest averaged 16 annas. The *Bassein* rainfall was sufficient in quantity, but the distribution was not favourable. Want of rain early in the monsoon delayed ploughing operations, and this and the scantiness of the closing rains reduced a promising crop to 14 annas. In *Henzada* the total rainfall was slightly below that of the previous year, but on the whole it was sufficient and fairly well distributed, a 16-anna crop being the result. *Myaungmya* suffered like Bassein from want of timeliness in the rainfall and the harvest was slightly below the normal.

Tenasserim Division.

43. In *Amherst* the earlier rains were favourable, but their sudden cessation in October spoilt a crop which would otherwise have been a good one, reducing it to 14 annas. The rainfall of *Tavoy* was not favourable for the same reason, but a 15-anna crop was obtained. In *Mergui* the rains set in early and the rainfall was considerably in excess of that of the previous year. Although there was a long break in July, the rains were not unfavourable to the main paddy crop, which in this district averaged about 15 annas. The early commencement of the monsoon interfered, however, with the preliminary work of jungle-clearing in the areas devoted to hill cultivation. The rains of *Toungoo*, *Shwegyin*, and *Salween* were abundant, timely, and well distributed, 16-anna crops being obtained in all these districts.

Northern Division.

44. The rainfall in *Mandalay* was good and evenly distributed. There were considerable extensions of the cultivated area and the crops turned out much better than in the previous year. Some slight damage was done to the dry-weather rice by inundations, but the year was unmarked by any serious calamity. In *Bhamo* the rainfall and harvest were above the average below the defile and not quite up to the average above it. The rainfall in *Katha* was plentiful and evenly distributed, and the harvest was considerably above the average. In the *Ruby Mines* district the rainfall was an average one and the harvest was a good one. The *Shwebo* rainfall, though not heavy, was evenly distributed and a fair harvest was obtained.

Central Division.

45. The rainfall of the *Ye-u* district was somewhat scanty and in the Southern subdivision the crops were poor: further north, however, there was an average crop. In *Sagaing* the rainfall was far above the average, and this, coupled with a timely rise of the river, gave the crops throughout the district all the water they required

and produced an excellent harvest. The only exception to this was cotton, which got too much rain and turned out badly. The *Lower Chindwin* rainfall was less than that of the previous year, but was above the average. The early crops did well, but jowar and sessamum were not very successful in consequence of want of rain in November. Taking the crops all round, the harvest was somewhat below the average. In the *Upper Chindwin* the rainfall was ample and very considerably in excess of that of the previous year. The harvest was a good one and large quantities of grain were exported from the district.

Southern Division.

46. In *Thayetmyo* the rainfall was much heavier than in the previous year and the harvest was a good one. The rainfall in *Pakôkku* was copious, but was irregular and unevenly distributed in some parts of the district. Crops on areas which ordinarily benefited by inundation were destroyed by heavy floods, but on the other hand high uplands for many years fallow were brought under cultivation. The harvest, speaking generally, was an average one, paddy being a bumper crop; tobacco, gram, and sessamum average; but jowar was a failure. The rainfall in *Minbu* was considerably above that of previous years. Slight damage was done by floods, but the harvest was on the whole above the average. Irrigated crops did well and much high land usually unworked was brought under cultivation. Dry-weather crops, including wheat, did badly and were much damaged by blight. In *Magwe* the rainfall was abundant, especially as regards the later rains. The rice crop in consequence was a good one, but jowar and oil-seeds got too much rain. Considerable areas of "in-daing," or dry undulating tracts usually unworked, were brought under cultivation.

Eastern Division.

47. The rainfall of the *Kyauksè* district was heavier than usual, but was irregular. Heavy showers in August spoilt the blossoming sessamum, and later on absence of rain during the transplanting of the main rice crop did some damage. The wheat crop was a failure, but as the main rice crop was a bumper one, the season was a decided success. In *Meiktila* the early rains were very favourable, but during the rest of the monsoon the falls were untimely. The early sessamum crop failed through want of rain in July, and the main rice crop which followed it could not be put down till late. The area under rice was, however, considerably extended and the outturn was fair. Cotton did fairly well and jowar was successful, although the area under this crop was reduced by the increased attention paid to rice. The rainfall in *Yamèthin* was much above the average and was on the whole timely. Large areas not cultivated for years were planted with sessamum and paddy, and in most places good crops were reaped. The rainfall in *Myingyan* was much above the average and, except in the extreme north of the district, was timely and sufficient. The harvest of jowar and rice was an exceptionally good one except in part of Kyaukpadaung. The cotton crop, however, suffered from too much rain.

Prices.

48. The price of paddy ruling in Rangoon at the commencement of the official year was Rs. 77. It fell gradually till July, when it reached its lowest point at Rs. 72. The price then commenced to rise in consequence of shortened supplies, the rate being Rs. 85 in August, Rs. 90 in September, and Rs. 100 in October; but in November the last few boat-loads of the 1892-93 crop were purchased at Rs. 90. In December the new crop commenced to come in, prices opening at Rs. 75. This rate was gradually reduced to Rs. 73 in January, Rs. 70 in February, and Rs. 68 in March.

49. The prices quoted at Rangoon practically rule the rates obtaining in other parts of Lower Burma, and they therefore show the terms on which the cultivators and traders disposed of the last of the 1892-93 crop and the first of the crop of 1893-94. The traders, who had been storing paddy in hopes of a rise, were severely hit by the low prices prevailing from April to July. When prices did rise in August most of the crop had been marketed, and only the more wealthy traders who had been able to hold out obtained the benefit of the improved prices. The prices from December to March are those which most directly affect the cultivator, as much of the produce is during these months sold direct from the

threshing floor without the intervention of a middleman between cultivator and boat-owner. The prices in 1893-94 were lower than in the previous year, and the cultivator, who had been touched by the low prices of 1892-93, realized still more forcibly the sudden reduction in his income.

Arakan Division.

50. In *Akyab* the price of paddy in April was Rs. 88 and remained steady during the rains. The price of the new grain opened at Rs. 68 in January and fell to Rs. 60 in February and March. The price of sessamum rose, but salt was cheaper than during the previous year. In *Kyaukpyu* the price of paddy was very high during the rains, averaging about Rs. 130 and rising to Rs. 170 in December for a short period before the new crop came into the market. These high prices were the result of over-selling, cultivators, tempted by high prices, having trenched very largely on their food stocks. In *Sandoway* the exceptionally high price of paddy was attributed to a short harvest in the previous season. Sandoway, not being an exporting district and being distant from the rice ports, is not affected by the ordinary export rates prevailing.

Pegu Division.

51. Throughout the Pegu Division paddy prices are governed by those ruling in Rangoon, and as these have been given, further comment is unnecessary. In *Pegu* the most noticeable changes in prices were the fall in the price of plough bullocks from Rs. 75 to Rs. 50, and in the price of fish from As. 6 to As. 4 per viss. Both these reductions in price are significant of the straitened circumstances of the cultivator, although in the latter case a part of the fall is due to a good fishing season and an increased supply of fish. In *Prome* the price of salt was Rs. 10 against Rs. 9 in the previous year.

Irrawaddy Division.

52. In *Bassein* prices of paddy followed the movements of the Rangoon market very closely. It may be said that the rate was about Rs. 10 lower during 1893-94 than in the previous year. The price of fish also fell slightly. Sessamum rose in consequence of decreased importations. The price of full-grown buffaloes fell from Rs. 78 to Rs. 59 and of bullocks from Rs. 48 to Rs. 32,—facts which, as was noticed in the case of Pegu, point to the neediness of the cultivator.

Tenasserim Division.

53. At *Moulmein* the price of paddy in April 1893 was Rs. 78. The price during the rains rose gradually from Rs. 85 to Rs. 90 in December. In January 1894 the new crop was brought into the market at Rs. 70 and this rate was maintained until March 1894. The price of plough bullocks in *Amherst* fell from Rs. 60 to Rs. 40. The fall in price is attributed to large importations from Siam and Zimmè, which have been already noticed in the paragraph on cattle. In *Tavoy* the price of plough bullocks fell from Rs. 45 to Rs. 27, due to want of purchasers. Sessamum prices fell largely owing to excessive importations from Rangoon, while the price of sugar, which is manufactured from dani (nipa palm), fell owing to depression in the Rangoon trade. In *Mergui* the Deputy Commissioner explains that the slight rise in prices is occasioned by their being referred to the 82$\frac{2}{7}$ lb. maund instead of the 80 lb. maund as heretofore. The increase in the price of firewood is attributed to a larger demand caused by the persons employed on the pearl-diving industry. In *Toungoo* prices showed a falling tendency during the year, the rise in the price of firewood being explained by the imposition of a duty at Toungoo, and by the exhaustion of supplies in the neighbourhood of the town.

Northern Division.

54. Prices of food-grains fell in *Mandalay* in consequence of the good harvest, the only exceptions to the general decline in prices being the case of pulses and salt. In *Bhamo* there was a slight decline in the price of rice,—market prices of other food-grains were not obtainable,—but the price of salt rose about 8 per cent. *Katha* shows a fall in the price of paddy and rice which is attributable to the good harvest. In the *Ruby Mines* district prices showed little variation from those ruling in the previous year. In *Shwebo* the prices of all food-grains fell largely and were rather below normal.

Central Division.

55. Prices of rice, gram and beans fell very considerably during the year in *Ye-u*. The general success of the harvest throughout Upper Burma brought down the price of rice, while the scanty rainfall in Ye-u increased the area under gram and beans at the expense of rice and lowered the prices of the former commodities. In *Sagaing* prices of food-grains fell as soon as it was clear that the season was to be a favourable one for agricultural operations. The prices were also to a slight extent governed by the low rates obtained for paddy in the Rangoon market. Low prices paid in Rangoon allow rice to be sent upcountry at cheap rates, and the price of local crops is thus kept down. In *Lower Chindwin* prices fell very considerably all round. In the *Upper Chindwin* the prices of food-grains fell, but pulses and salt rose.

Southern Division.

56. In the *Thayetmyo* district there was a heavy fall in the prices of all food-grains with the exception of Indian-corn, the price of rice being very low. In *Pakôkku* there was a general fall in the price of rice, oil-seeds, and gram. In *Minbu* prices of food-grains fell with the exception of wheat. In *Magwe* there was a heavy fall in food-grains with the exception of pulses, which rose slightly.

Eastern Division.

57. Paddy, rice, and wheat prices showed a heavy fall in *Kyauksè* as compared with the previous year; oil-seeds fell slightly; but the price of pulses increased. During the three months following the rice harvest of December and January prices of paddy and rice were extraordinarily low, and for some time there were no exports and no market. In *Meiktila* prices of food-grains fell heavily and were very low. The abundance of cheap rice drove jowar out of the market, and its nominal price fell from Rs. 95 to Rs. 23. Prices in *Yamèthin* fell as in other districts. Increased attention to rice reduced the supply of pulses and prevented the price of this commodity from sharing in the common fall. In *Myingyan* the ample supplies resulting from good harvests reduced the prices of all food-grains, and the local rates paid for rice were far below the normal. The price of cotton fell because the quality was bad.

SECTION III.

FODDER RESERVES AND ARBORICULTURE.

58. In Lower Burma there was a net increase in the area reserved for grazing purposes, but in the Thôngwa district large tracts used as pasturage, but not formally reserved, were allotted for cultivation. This is unfortunate in a district where the stock of horned cattle is increasing from year to year with great rapidity. Information about grazing-grounds has been included in paragraphs 88 to 91 of the Revenue Administration Report. In Upper Burma grazing-grounds have not been formally reserved, and there is so much waste interspersed with the cultivation that the question of reservation is not one of urgency.

59. Some interesting remarks on arboriculture are made by Mr. Hildebrand in the closing paragraphs of his report on experimental cultivation (see Appendix I to this report). On the Upper Burma country roads shade trees would be a great blessing, and the planting of these roads might perhaps be carried out by the people with Government help and encouragement.

SECTION IV.

AGRICULTURAL EXPERIMENTS.

Experimental cultivation in the Northern Shan States—The Lashio farm.

60. Very little was done on the Lashio farm during the year 1893-94. The farm Superintendent, Mr. Hillier, resigned his charge in May 1893 and from that date until October of the same year the farm was without a paid manager. In October M. R. R. Rajagopal Naidu, whose services had been obtained through the Madras Government, took over charge. M. R. R. Rajagopal Naidu did little except writing lengthy reports on the previous mismanagement of the farm, backing up his reports with extravagant indents for implements which he had not the

means of using and seed for which he could not prepare the ground. Altogether the experiment gave such poor prospects of success that, after considering whether a better site for wheat could not be obtained, it was decided to close the farm. The manager was therefore sent back to Madras and the live and dead stock of the farm were put up to auction. Unfortunately disease broke out amongst the live stock a short time before the auction, and instead of recovering Rs. 3,000 as was hoped, the amount finally realized at the sale was only Rs. 1,050.

61. Difficulties in the way of efficient supervision were the principal causes which led to the failure of the Lashio farm. It was situated some 6 miles from Lashio itself, and although the Superintendent of the Northern Shan States did what he could, he had of course other duties and was often absent on tour for months together. During the whole time that the farm was open, it was never possible for the Director of Agriculture to pay a visit of inspection and see what was really being done, and under the circumstances failure was not surprising.

Experimental cultivation in the Southern Shan States.

62. In the Southern Shan States the experimental cultivation carried on by Mr. Hildebrand was successfully continued during the year. Mr. Hildebrand's report has been printed, and has been bound up with this report. The report shows that the expenditure on the farm during the year 1893-94 was about Rs. 4,100. Adopting, however, the figures given in the report for the period from the 1st June 1893 to the 31st May 1894, it is seen that the expenditure during that period was Rs. 3,728 against receipts Rs. 2,309, or a net charge of Rs. 1,419 only.

Mr. Hildebrand's experimental orchard and garden.

63. The experiments cover about 41 acres. Of this some 20½ acres are under orchard, 1 acre is under vegetables, and the remainder has been cleared for further extensions. Endeavours were made to engage an experienced gardener for the grafting of the fruit trees. This man could not be obtained in Rangoon, and as the experiment of introducing an officer from Madras for the charge of the Lashio farm had proved a failure, it was not considered advisable to import another man from India without some sort of guarantee that he would be permanently useful. Mr. Hildebrand has since been asked to try and arrange for a good man, and it is hoped that his recommendations will be received in time to get the necessary grafting done during the next dry weather.

64. The orchard, except that the trees now require grafting, is doing well, but the vegetable garden was badly damaged by a flood, and as there is no local market for the produce, Mr. Hildebrand will probably discontinue this part of his experiments.

Wheat cultivation, Southern Shan States.

65. The wheat harvest of the year was a bad one, but there was a considerable increase in the area under this crop, about 3,000 baskets being produced against 900 baskets in the previous year. Unfortunately the price, Rs. 6 per basket, obtained by the cultivators was not what it had been in previous years; and this lowness of price, combined to some extent with the bad harvest, will very possibly discourage further extensions of cultivation and seriously check an important industry. The seed wheat, which has now been introduced into the Southern Shan States, was imported from the North-West Provinces. It was distributed to the cultivators as an agricultural advance and its value is being steadily recovered. Experiments made by Mr. Hildebrand himself tend to show that fairly certain crops of wheat can be grown on the black loams found in the valleys and that in such places the best time to sow is during August and September.

Potato cultivation, Southern Shan States.

66. Attention was paid to the introduction of the kidney variety of potato, which it is hoped will supersede the very inferior Shan variety which is already grown to a large extent. The principal difficulty in connection with this experiment is in getting the seed potatoes to the distributing centres in good condition. The potatoes can be landed at the Meiktila-road station in good condition, but transport from thence to Fort Stedman is not always immediately available, and the journey at best is a long one for goods liable to rapid deterioration.

Wheat cultivation, Upper Burma.

67. Experiments with wheat cultivation were carried on in Katha and the Ruby Mines. No report on the result of the experiment has been received from the former district, but in the latter the experiment proved a failure (see Statements II-A and III-D). The seed was obtained from the North-West Provinces and from Sagaing, and its cost was as a rule recovered from the cultivators to whom it was issued. Cases occurred in which the value of considerable quantities of wheat seed supplied to District Officers had to be written off as irrecoverable either because it was not distributed when received or because, through late requisition, the seed was not available until after the proper sowing season. The total amount thus written off was 159 baskets valued at Rs. 266. Under the instructions of the Financial Commissioner circulars were issued pointing out that the loss should be avoided and drawing attention to the instructions already laid down for the due submission of indents.

68. The total area under wheat cultivation in Upper Burma was almost the same as in the previous year, being 21,000 acres. Of this area some 13,000 acres are in Sagaing, 3,000 in Minbu, 2,000 in Mandalay, and 1,000 in Pakôkku. As has been remarked in a previous paragraph, the year was a disastrous one for wheat, very large areas being attacked by rust.

American maize.

69. Some 1,300 cobs of American maize were as usual obtained from Philadelphia and were widely distributed. Statement III-A of the appendices gives the result of these experiments and shows that as a rule the sowings were not successful, but good results were obtained in the Lower Chindwin, by Mr. J. Petley in Toungoo, by the Reverend H. Morrow in Tavoy, and by the Agri-Horticultural Society of Tenasserim. Very little information has yet been obtained as to the conditions under which this crop should be uniformly successful, but by tabulating results, as has been done in the statement attached to this report, it is hoped that experience will show the soils, date of sowing, &c., which are required to ensure success. The American maize cobs are much larger than the Burmese variety, and although the Burmans have some prejudice against them on the ground that the grains are coarse and unpalatable, there is no doubt that if they can be successfully grown they will become popular.

American tobacco.

70. Forty lbs. of American tobacco seed were obtained and distributed in four districts. Statement III-B shows that the experiments proved a failure in all cases, a result which can only be attributed to want of care, as the seed was undeniably good when distributed.

English vegetable seeds.

71. English vegetable seeds were obtained through the Agri-Horticultural Society, Rangoon, and were distributed to a number of districts. The experiments were, as a rule, successful, being generally carried out with care by officers at headquarters (see Statement III-C).

Reports regarding results of experiments.

72. The reports regarding results of experiments are, as a rule, meagre and afford little information. It is inadvisable to burden persons experimenting with complex and lengthy reports, but if the diary form of experimental cultivation (prescribed in Director's Circular No. 11 of 1892) could be written up, the results of experience would be ascertained and instructions might be issued which would lessen the chances of future failure. Notes in Burmese and English giving the methods practised in the cultivation of the various crops have been printed and are circulated with each consignment of seed.

Agricultural shows.

73. Agricultural shows were held in the Bassein, Amherst, and Upper Chindwin districts. The total allotment for agricultural shows was Rs. 4,000 divided equally between Lower and Upper Burma. Of this sum only Rs. 990 were expended during the year under report.

Programme for future agricultural shows.

74. Agricultural shows are not always successful, and unless the cultivators understand the object with which they are held, the money spent upon them is practically wasted. Failure, too, has in some cases been due to the fact that

the shows have not been properly advertized. In order to make the shows more popular, to educate the people as to their objects, and to ensure that the site and date of the shows are widely known, a programme has been drawn up, with the approval of all Commissioners and District Officers, prescribing the places at which the shows are to be held during the next three years. This programme provides one show in each division, but limits the area from which exhibits may be sent up to the tracts or districts within a convenient distance of each show. The sites and dates of the shows are, as far as possible, chosen so as to fit in with annual pagoda festivals or other gatherings which will ensure a good attendance and numerous exhibits. The arrangements made are given in the following statement:—

Division.	District.	Town.	Date.	Occasion.
Arakan ...	Akyab ...	Akyab ...	March (Full moon of Tabaung).	Pagoda festival.
Pegu ...	Tharrawaddy ...	Tharrawaddy ...	Ditto ...	Pagoda festival.
Irrawaddy ...	Henzada ...	Zalun ...	January ...	...
Tenasserim ...	Amherst ...	Moulmein ...	February ...	Annual show of the Tenasserim Agri-Horticultural Society.
Northern ...	Mandalay ...	Mandalay ...	Ditto ...	...
Central ...	Sagaing ...	Myinmu ...	April ...	...
Southern ...	Minbu ...	Kyaundawya ...	March (Full moon of Tabaung).	Pagoda festival.
Eastern ...	Yamèthin ...	Pyawbwè ...	Ditto ...	Pagoda festival.

75. The expenditure to be incurred on each show will vary from Rs. 200 to Rs. 500 and will be met from the budget allotment of the year. Proclamations, describing the objects of the show and the prizes and certificates to be awarded, have already issued in most cases, so that ample notice has been given. Statement IV of the appendices gives a list of the prizes awarded at the three agricultural shows held during 1893-94.

Kyonpyaw show.

76. The show in the Bassein district was held at Kyonpyaw on the 12th March 1894. The attendance was poor and exhibits were so few that the committee did not distribute all the prizes advertized. The committee attributed the want of success at this show to the fact that it was held when revenue officers were busy with their revenue collections. This is probably true to a certain extent, but agricultural depression and other causes were also responsible for the failure.

Moulmein show.

77. The show in the Amherst district was held on the 9th February 1894 in conjunction with the horticultural show and under the management of the Tenasserim Agri-Horticultural Society. The exhibits consisted of 19 animals and a number of entries of other classes such as paddy, cloves, vegetables, poultry, &c.

The quality of the animals exhibited was fair. In addition to money prizes, gold-letter certificates were awarded to the recipients of 1st prizes, and black letter certificates for 2nd prizes and honorable mention. It was estimated that from 2,000 to 3,000 persons visited the show, and altogether it may be considered to have been a success; a result in no small measure due to the exertions of the Society mentioned above.

Mingin show.

78. The show in the Upper Chindwin was held at Mingin on the 15th March 1894 and was disappointing in its results. In previous years this show was very successful and the reasons for its failure in the year under report are not clear. No agricultural implements were shown and the exhibits of paddy, poultry, honey, wood-oil, &c., were distinctly poor.

SECTION V.

* CATTLE-BREEDING AND VETERINARY ESTABLISHMENTS.

Cost of Veterinary Department.

79. The cost of the Civil Veterinary Department during the year under report was Rs. 39,432, of which Rs. 12,160 was Imperial, Rs. 16,552 was Provincial, and Rs. 10,720 was debited to local cess, the Upper Burma charges and the Superintendent's salary being debitable to Imperial funds.

Junior Veterinary Assistants.

80. The number of junior veterinary assistants employed was 15, the same as in the previous year. Of these men one was employed at headquarters and one at Mandalay, while the rest were distributed over the Lower Burma districts. During the year two of the Lower Burma assistants had to be sent to Upper Burma on special duty in connection with outbreaks of disease: 4,403 cases were treated by the assistants and cures are said to have been effected in 3,963 cases, which is a very large proportion of the number under treatment. These figures must, however, be received with reserve, as it is not possible to properly check the statements of the assistants, and there is no doubt that in the case of the more malignant diseases the percentage of recoveries must be small. The Superintendent in his report has specially praised the work of six of his junior assistants, while the work of the rest was for various reasons more or less unsatisfactory.

Superintendent and Senior Assistant.

81. The Superintendent was assisted in the work of veterinary instruction by Mr. Battivala, senior veterinary assistant, and by Maung Pon Kin, the school interpreter. Mr. Battivala also assisted to some extent in district inspection and was on tour for some 30 days during the year. This was quite as much as could be expected, as his duties keep him closely tied down to headquarters during the school terms. A second senior veterinary assistant, Bhagwan Singh, was posted to the department just before the close of the official year. This officer's services have been obtained for the special charge of the police ponies, which are very numerous and require constant attention.

Pony-breeding.

82. The year was a most unfortunate one in respect of Government pony-breeding operations; one stallion—Emperor—and four promising colts died of anthrax, and it has not been found possible to replace them as yet.

Mule-breeding.

83. Two donkey stallions were sent to the Superintendent of the Southern Shan States during the year. A donkey stallion stationed in Upper Burma was reported to be almost impotent and is to be sold. Suggestions for starting mule-breeding at Maymyo were considered, but recommendations for limiting operations to pony-breeding were made.

Veterinary school.

84. The veterinary school was open during the year and had on the 31st March 34 pupils on the rolls, all of whom were just completing their three years' course of instruction. The pupils were all given 2½ months practical instruction in the field, being attached during this period to veterinary assistants on active duty.

SECTION VI.

AGRICULTURAL AND FISCAL STATISTICS.

Rainfall statistics.

85. There were 102 rainfall stations open at the commencement of the year; 18 were opened and 6 were closed during the year, leaving 114 stations registering rainfall on the 31st March 1894. Thirty-nine rain gauges were issued during the year and two were returned into stock. All the registering stations submit monthly statements of the daily rainfall, 94 references about inaccuracies or discrepancies were made by the head office during the year, and 23 statements had to be returned for revision. Reports of inspections of rainfall recording stations were received in 31 cases.

---

* See the report for 1893-94 of the Civil Veterinary Department, Burma.

Crop reports.

86. Crop reports were received weekly from all districts except Arakan Hill Tracts, Rangoon Town, and Salween. During the year the new district of Myaungmya was added to the districts reporting and Pyinmana (amalgamated with Yamèthin) was excluded. The reports of the Northern Shan States were interrupted from the 10th March 1894 to the 21st April 1894 owing to the destruction of the Lashio office by fire. During the year 33 reports were received too late for inclusion in the weekly returns, and 254 references were made by the head office regarding omissions and discrepancies. References were most numerous in the case of Henzada in Lower Burma and the Ruby Mines in Upper Burma. Revised instructions for the preparation of the reports were issued in Director's Circulars 9 and 11 of 1893 and, since the close of the year, further explicit instructions have been issued in Circular 3 of 1894.

Monthly food-supply notes.

87. Monthly notes on the wholesale prices of the principal food-grains were issued for Rangoon, the Upper Burma districts, and the Northern and Southern Shan States. The figures for these notes were compiled at headquarters from the weekly crop reports.

Fortnightly statements of retail prices.

88. Fortnightly statements of retail prices were furnished by 16 districts in Lower Burma and 4 districts in Upper Burma; 45 of these statements were received late, and 146 references about omissions and discrepancies had to be made by the head office during the year.

Normal prices of food-grains.

89. The statement of normal wholesale prices, previously prepared for paddy in Lower Burma, was extended to Upper Burma and was amplified so as to include prices of rice, and for jowar in districts where it is largely grown. This amplified statement has been included in the draft Revised Famine Code and is attached to this report as Statement V of the appendices. The prices in Upper Burma will require revision a few years hence as some of them are not based on sufficient data to be satisfactory, and the extension of railways, improvement of communications, and alteration of conditions as regards markets, will cause changes in prices.

SECTION VII.

* Trade and Trade Statistics.

Internal trade registration.

90. The registration of trade between Upper and Lower Burma was carried on at the same stations as in 1892-93. These stations were—

Allanmyo ...	Boat traffic.
Allanmyo Thayetmyo (two routes) Kyaukpadaung Toungoo	Road traffic.

Besides the trade registered at these stations, statistics for railway-borne trade are furnished by the Examiner of Railway Accounts.

External trade registration—Number of stations.

91. The registration of the overland trade between Burma and the adjoining countries was continued during the year, the number of registering stations being increased from 7 to 8. The new station is situated at Möngmit and records trade with the Northern Shan States which previously escaped registration. This station was opened in January 1894. Arrangements for opening two stations in the Kyauksè district for registering Southern Shan States trade were also made, but these stations were not actually opened until the beginning of 1894-95.

Alterations in system of registration.

92. The system of registration at Bhamo was reorganized from the 15th June 1893, special arrangements being made for registering the river traffic. No alterations in the arrangements for registering trade at Lower Burma stations were made during the year, but it was decided to open a new office at Pa-an in the Amherst district at the commencement of 1894-95.

* See the reports for 1893-94 on the External (Overland) and Internal Trade of Burma.

93. During the year the establishment of the Trade Department in the office of the Director was increased by the addition of a head clerk and two junior clerks. Unfortunately arrears accumulated to a large extent before this additional establishment was entertained and it has not yet been possible to clear them off. Strenuous efforts are now being made to bring the work up to date, and it is believed that when outstations are made to do their proper share of work the arrears can eventually be wiped off with the present establishment. Mr. Claridge, the Superintendent of Trade Registration Offices, did good work during the year in the office and carried out useful inspections of outstations. The staff also, with some exceptions, did well.

Trade registration establishments.

94. An estimate of the rice crop of Lower Burma was drawn up in December and January and was finally revised in February 1894, when it was calculated that 1,326,000 tons of cargo rice should be available for export. Supplies of paddy came in very slowly in the early part of 1894 as prices were very low. It was suggested that the estimate was too high, and at the request of the Rangoon rice merchants enquiries were made as to the extent of stocks still available for sale and export from the rice-producing districts. This enquiry showed that the area under rice cultivation had been slightly over-stated, but the information as to reported depletion of stocks was inconclusive. Later on, when prices were raised, paddy began to come in more freely, and now it is believed that the estimate was near the mark.

Rice-crop estimates.

SECTION VIII.

PERSONNEL OF THE DEPARTMENT.

95. Mr. Wilson was in charge of the Department from the 1st to the 29th April 1893. Mr. Hall then officiated until the 29th November 1893, when Mr. Mathews came out from furlough and took over the officiating charge, which he held till the end of the year.

Director.

96. Mr. Clancey, the Senior Superintendent, who was in charge of the Lower Burma Field-to-field Survey Party (Local Agency), was on the close of survey operations in November 1893 seconded for duty as Assistant to the Director. Mr. Gibson, Superintendent, Mandalay, took over charge in the linked district, Kyauksè, from the 23rd May 1893. Mr. Ford was transferred from Hanthawaddy to Pegu on the 14th September 1893 and Mr. Torrens from Pegu to Hanthawaddy on the 16th September 1893. Mr. Beechey, Superintendent, Bassein, was on privilege leave from the 3rd October 1893 to the 2nd January 1894. Mr. Haddock of the Field-to-field Survey Party was appointed Superintendent from the 1st November 1893 and was posted to Prome. Maung Ngwe Kaing of the Subordinate Judicial Service was appointed Superintendent from the 14th February 1894 and was posted to Amherst. Maung Shwe Gyôk was suspended for gross misdemeanours from the 23rd October 1894 and was afterwards transferred to the Subordinate Judicial Service. Mr. Munro was on privilege leave from the 8th September 1893 to the 7th October 1893 and was afterwards transferred from Thôngwa to the Myaungmya district. Mr. Hardinge of the Field-to-field Survey Party was appointed Superintendent from the 31st October 1893, and Mr. W. S. Wood, Probationer, was on leave from the 8th August 1893 to the 23rd September 1893, and was appointed Superintendent from the 1st November 1893. Mr. W. S. Wood was posted to the linked charge of Kyaukpyu and Sandoway and has died since the close of the year. Maung Kyi O, Probationer, was appointed Superintendent and was posted to the linked charge of Tavoy and Mergui.

Superintendents.

97. Maung Pe Maung, Probationer, Thôngwa, acted as Superintendent, Thôngwa, during the time that Mr. Munro was on privilege leave. Maung Pe Maung was transferred to the Amherst district, officiated as Superintendent, Amherst, from the 1st November

Probationers.

1893 to the 13th February 1894, and then remained on as Probationer in that district. Maung Do Kaing was appointed Probationer from the 1st November 1893 and was posted to Sandoway. Maung San Shwe was appointed Probationer from the same date and was posted to Thayetmyo.

H. M. S. MATHEWS,

The 24th October 1894. *Offg. Director of the Department of Land Records and Agriculture.*

APPENDICES.

STATEMENT I.

REPORT ON EXPERIMENTAL CULTIVATION IN THE SOUTHERN SHAN STATES FOR 1893-94.

THIS report is for the period 1st June 1893 to 31st May 1894.

2. *Grant.*—The original grant for the year was fixed at Rs. 3,300, but as this was found to be insufficient, a further grant of Rs. 1,000 was made, bringing the total grant to Rs. 4,300.

3. *Expenditure and receipts.*—The total expenditure for the financial year 1st April 1893 to 31st March 1894 was a little below the grant and amounted to Rs. 4,106. For the year under report, namely, 1st June 1893 to 31st May 1894, the total expenditure was Rs. 3,728-9-1, *vide* Statement **A** annexed.

The total receipts credited in the treasury for the year under report have been—

		Rs.	A.	P.
1.	Sale of vegetables	92	1	4
2.	Sale of potatoes	780	15	0*
3.	Sale of seeds	6	0	0
4.	Sale of wheat	1,430	4	0†
	Total ...	2,309	4	4

Deducting therefore the cash receipts from the amount expended from the grant, the actual net cost to Government of the experimental cultivation will be Rs. 1,419-4-9 for the period 1st June 1893 to 31st May 1894.

Statement **A**, annexed, will show the headings under which these receipts and disbursements have been realized and expended, and Statement **B** will give the details of the expenditure.

4. *Work for the year.*—What has been done for this expenditure to Government of Rs. 1,419?

The planting up of the previous orchard of 20½ acres has been completed. There is now not a gap in it.

In addition, an extension has been made at the northern end to accommodate the indigenous seedlings ready for planting out.

This expansion has been cleared and all the roots grubbed up. It has been drained, fenced, and roads made, and although I have not as yet been able to survey it the area cannot be less than 15 acres.

The vegetable garden has been kept up as before.

A further experiment on a large scale has been made in potato-growing, and the several experiments in wheat have been made with the view of ascertaining whether wheat cannot be grown as an ordinary *taungya* crop, the same as paddy is grown in *taungyas* in the rains; and, if so, the method to be used and the date for sowing.

Besides the above, three carts and three pairs of bullocks have been added to the stock in hand, and commodious sheds for storage of potatoes and wheat and houses for the orchard coolies and bullocks have been constructed. Details of the results of the experiments will be given, and though the season has been a most disastrous one, the expenditure cannot be regarded as excessive for the results attained.

5. *General remarks.*—The principle of employing only indigenous labour and of not attempting more than any ordinary village agriculturist could attain has been maintained. For the purposes of grafting and pruning the European fruit trees, an endeavour was made by me to obtain the services of an expert.

The local Government, however, could not sanction the appointment, so that the valuable fruit trees imported from England and India are running wild, and the not less valuable stocks of indigenous apple, pear, plum, peach, &c., trees have made such rapid growth as to be getting too large to graft upon without cutting down and wasting a year's growth and throwing back, and therefore weakening the stock.

6. *Establishment.*—The establishment has consisted of the same head gardener, who is a Burman, and three men, natives of the Shan States, under him. Casual coolies are called in for what is required beyond the power of these. My Shan interpreter, Maung Saye, who has a good deal of spare time, has spent the whole of it in supervising the cooly gangs and has been most valuable. In the matter of labelling trees, or making out stock lists of trees alive, and accounts generally, Maung Bwa, one of my general office clerks, has also given me much valuable assistance in his spare time, while for the direction and encouragement of the cultivation of wheat for the Commissariat requirements the

* Rupees 253 have since been credited under this head and will appear in next year's accounts.

† This sum was credited in the treasury in June 1893 as profits on sale of wheat.

Treasurer, Maung Po Mya, has been as indefatigable as ever; and that the cultivation of wheat should have arrived at the advanced stage it has is principally due to the interest he takes in the success of the experiment and of his personal exertions in his leisure hours.

For myself I regret to say that I have been incapacitated from walking or riding since 8th August 1893, and for what has been done since then and is now being done I have to borrow the eyes and ears of others.

I hope shortly, however, to be able once more to take the field in person.

7. *Vegetable garden.*—The vegetable garden was formed from a swamp or morass on the main drainage of the plateau upon which the station of Taunggyi is situated. A bund was thrown across this so as to divert the surface drainage from the spring where the drinking water comes out of lime-stone rocks, pure and cold, and a diversion was made to carry off the surface water.

This has now existed and worked well for three years, during which time the soil in the garden has mellowed and ripened, and become light and friable and most excellent for the purpose.

The bund across the main drainage formed a pond, which was most useful for bathing, &c., and as it always dried up in the dry season, and as I had a small balance from the grant for the upkeep of these temporary works, I devoted it to the enlargement of this bund with the view of forming a good-sized sheet of water, which, besides its value for bathing and other purposes, would add very greatly to the natural beauties of the station. As all these temporary buildings and works had to be made over to the Public Works Department, this balance was made over and the work was done by the Executive Engineer.

I regret to say that early in May last during a heavy thunderstorm I am told that the water overtopped the bund and breached it so seriously that the whole country below it was suddenly inundated; and as all happened in a few minutes, nothing could be done to save what came in the way of the flood. In the vegetable garden, during my absence in Fort Stedman and at home on short leave, I had massed all the flower tubs and pots that are usually about the house, including geraniums, lily bulbs, a particularly choice collection of roses only just arrived from Kew, and other flowers.

The flood, I am told, has carried away the top soil from the vegetable garden in tons, and practically laid the lower stratum bare, and with it of course went the stock of vegetables and all my treasures of flowers. The garden is a ruin.

It was originally started for the purpose of getting the local village gardeners to grow European vegetables for the regiment, which at that time was to have been stationed at Taunggyi.

It is now, however, decided that the regiment will remain at Fort Stedman, which is out of range to be supplied from Taunggyi.

The civil station will be too small to make it worth the while of the villagers to grow for its requirements, and the object for the garden appears therefore to have been removed. On my return to Taunggyi, and when I am able to inspect the garden, if the damage done is as described to me, I shall make no effort to re-make it and shall cease the experiment.

The total cost of the garden for the year has been Rs. 147. The receipts have been Rs. 92, and would have been more had not the whole stock-in-trade been carried away when the bund burst.

The total cost to Government has therefore been Rs. 55.

From the ripeness and mellowness of the soil the quality of all vegetables has greatly improved during the year, and the quality and prolificness of the asparagus and crown artichokes far exceed anything I have ever seen in England, and excellent asparagus has been selling at 4 annas the viss. What a source of health-giving food-supply is cut off from the inhabitants of Burma for want of a railway!

8. *Wheat.*—The cultivators of wheat for the market have been hard hit during the year (*a*) from the total cessation of rain from the end of October until the harvest, (*b*) from the Commissariat contract for the supply of wheat for the regiment at Fort Stedman having been given to a native of India who tendered lower than the local Shan contractor and at a rate at which it is absolutely impossible for him to supply except at a heavy loss.

He trusted to the crop grown in the Shan States to supply his requirements, and in ordinary seasons his calculations would no doubt have been near the mark. From the unprecedented total cessation of rain from the end of October, however, the crop has not reached a total of three lakhs of pounds, whereas his contract is for something over eight lakhs. The balance will have to be imported, and whereas his tender is to supply at Rs. 5-11-0 per 100 lbs., it will cost him from Rs. 9 to Rs. 10 per 100 lbs. to import from India.

Last year the crop realized at the rate of Rs. 8 per 100 lbs., from which Rs. 2 was paid me by the cultivators for the cost of seed and Rs. 6 was left for them. This year the contractor has so far beaten the cultivator down to Rs. 6 per 100 lbs. of which Rs. 2 will have to be paid to me on account of seed, which stands against the cultivators as an agricultural advance, so that Rs. 4 per 100 lbs. only will be left for the cultivator.

As many have ploughed up their sugarcane lands and sown wheat instead as being a more paying crop, and as from the dry season and from the fall in prices the profit on wheat will have become about one-half what it was last year, those who held on to their

sugarcane have had the best of it; and the growth of wheat has become discredited. I did all I could by writing to the Commissariat authorities and the local Government to point out what would happen if the contract was given to the native of India tenderer for the contract, but I could get no mercy. The wheat bubble has now burst, and it remains to be seen whether the growth of wheat will survive the shock. About one lakh of pounds of wheat have already been handed over to the contractor at Rs. 6 a basket, for which nothing has as yet been paid, and I have had a deputation of some 60 growers petitioning for payment.

The cultivators, under my advice, are now holding out against supplying the balance of the crop under Rs. 8, the lowest they can afford to sell at to give sufficient encouragement to stimulate its growth.

In all 800 maunds of seed wheat was imported and distributed, and 400 maunds were purchased locally and distributed.

The cost of this stands as an agricultural advance and amounts to Rs. 7,976, all of which has to be recovered from the cultivators.

As the balance of the crop still remains unsold, I am unable to report how far this recovery will be effected or the system I shall adopt in consultation with the cultivators to recover it; but the system adopted will be the one which will have the least effect in checking the continuation of the growth of this cereal, if it is still possible to get any more grown.

Last year the total crop was about 900 baskets. This year, bad as it is, the crop is estimated at 3,000 baskets, but will probably fall slightly short of that total. Last year I was able to report a yield of as much as sixty-fold in some cases. This year the very best yield has been ten-fold, and total failures have been frequent; in fact, the total yield has not realized quite three-fold of the seed sown.

It is hard to say quite what instructions to give to cultivators to assist them. As the crop was suffering from want of rain, I advised irrigation, and the result is that while fine crops of straw and wheat ears have been garnered on the irrigated fields, there has been no grain, while those that could not or (apparently wisely) did not irrigate have harvested more grain and considerably less straw.

Again, while October and November have hitherto proved to be the best months to sow in, this year the best crops (bad at that) have been harvested from fields sown as late as December and even January. Not having been able even once personally to visit the fields, as I have always hitherto done, I am unable to account for these apparent anomalies, and no explanation is better than one based on false premises, so I will attempt none.

Having commenced in 1891-92 with practically forcing the cultivators to sow 48 baskets of seed wheat, and having got cultivators willing and anxious to sow 174 baskets in 1892-93 and still more anxious to put in all they could get (namely, 1,000 baskets) in 1893-94, it does seem false policy that the new industry should be suddenly ruined because there are certain Commissariat rules which oblige the Commissariat Officer to give the contract to the lowest bidder, even though, as in the present instance, the tender is one which it is an absolute impossibility to carry out without very serious loss. The saving, even if made, is as nothing compared with what the loss will be in subsequent years, when wheat has ceased once more to be grown here. Let the local Government call for rates paid for wheat to supply the Fort Stedman garrison previous to the year 1891 and the rate tendered by the local Shan trader for 1894-95, and see what the saving would have been simply on account of the wheat locally produced. For 1895-96 a recurrence is probable to the rates anterior to 1892. Was the saving of a paltry sum of Rs. 10,600 on the contract for the year a sufficient reason for the non-acceptance of the local tenderer and the discouragement of still further exertions in the growth of wheat?

In recovering this year from the crop of last year for the repayment of the amount of the agricultural advance at the rate of Rs. 2 a basket, a sum of Rs. 1,430-4-0 was realized in excess of the sum advanced. This was paid into the treasury and shows in Statement A as a credit on account of sale of wheat.

9. *Wheat as a taungya crop.*—Besides this main experiment for the supply of the local market, experiments were also made in *taungyas* and in the Taunggyi orchard with the view of ascertaining (*a*) if it could not be grown as a taungya crop in the rains; (*b*) the best way to do it and the time to sow.

Of the 12 taungyas in which a *salè* or so of seed was sown at the same time as the paddy and in precisely similar circumstances, only three failed, and in those the paddy failed also.

In nine of them a good outturn was realized.

The same experiment was tried by me and carried out under my own eyes in 1-acre plots in the orchard.

They cost absolutely nothing, as the land must have been dug and kept weeded in among the fruit trees which were there, even if wheat had not been grown; but for statistical purposes I kept strict accounts of each plot, of the date of sowing, cost of digging, weeding, &c., and date of reaping and outturn as long as I was able to do so.

Each plot was a measured acre and the result is given in the table below :—

Plot.	Seed sown.	Crop reaped.	Date of sowing.	Date of reaping.	Cost of preparing land and sowing and harrowing.	Cost of weeding.	Remarks.	
	Pyi.	Bkt. Pyi.			Rs. A. P.	Rs. A. P.		
1	7	0 7	27th May...	31st Augt.	16 14 0	1 8 0	Soil red clay, quite unsuited to wheat. Harvested in the rain.	All on hill slopes.
2	7½	4 4½	28th June...	20th Oct. ...	23 5 0	11 10 0	Soil mixture clay and loam. Harvested in the rain.	
3	7	0 11	2nd Augt.	No note ...	16 4 0	7 13 0	Soil red clay. Plants never grew above 18 inches high.	
4	7¼	10 0	28th Sept.	March 1894	18 10 0	No note	Black loam on the flat.	
5	8	7 0	1st Nov.	Do.	15 14 0	Do.	Ditto.	

From the foregoing table it will be seen that in the plots 1 and 3 the seed sown was garnered and not much more. Wheat will evidently not grow on red clay, at any rate without the assistance of manure, and as this is the general nature of the soil in the Myelat, it cannot be grown there except on selected sites.

On plot 2 the outturn was seven-fold. It ripened in October and was harvested in the rain as best we could, or the outturn would have been much more.

As the next plots for sowing were on the flat, Nos. 4 and 5 were not sown until 28th September and 1st November respectively. The soil was black loam. Plot 5 had a good sprinkling of rain in October and yielded 10 baskets or twenty-two-fold. No. 5 plot was sown on 1st November and had only one shower from the time of sowing till it was reaped in March. Parts of it were irrigated and parts could not be. The irrigation appears to have done neither good nor harm, the yield being apparently the same in both places.

The outturn, however, was only 7 baskets or fourteen-fold.

From the above it appears clear that it is of no use to sow wheat on red clay.

It appears equally clear that in the valleys where there is a good black loam a fair crop is almost a certainty.

That to sow before the middle of July is to sow too early, and that from end of July to end of September is the best time to sow for a wet-weather crop.

If the latter rains are late a sowing up till the end of October would be in time: later than that would be risky. The advantage of an early sowing in July is that the crop can be used for seed in the Nyaunghwe valley, where the sowings are made up till December.

10. *Potatoes.*—The growth of potatoes has passed out of its experimental stage, except that I want to oust what is called the Shan potato and introduce a better variety.

Unfortunately it is a very prolific variety, and a good sample will command a fair price, so that many prefer to grow it to the better kinds; and on the other hand those that appreciate the better price that the better kinds always command are very jealous of letting any of their seed get into the hands of other growers. The kidney variety introduced two years ago has got into the hands of some 20 growers, who do all they can to prevent others getting it. Mr. Giles estimates that while some 16,000 viss only of the kidney variety were dug for last year's crop, at least 127,700 viss of the Shan potato was grown. Last season was an exceptionally bad one for potatoes, and also for tomatoes and chillies, all of which appeared to be affected in the same way.

When half-grown they suddenly blackened and died. In some parts the potato plants flourished and an excellent crop was anticipated. When dug, however, there were no tubers at all. This was no doubt due to too rich a soil. The cause of the other disease I have failed to ascertain. It is estimated that in the Myelat alone, where the bulk of the potatoes are grown, not less than Rs. 22,700 have been received for last year's potato crop.

This is encouraging, when we remember that the growth of potatoes may be said to have commenced with the distribution of 125 maunds of seed in 1892.

11. Potatoes were sown in the orchard with the double purpose (*a*) to grow seed for distribution, (*b*) to utilize the spaces between the fruit trees which must have been kept hoed to keep down the weeds and which I thought might just as well grow a short

growing crop, such as potatoes, instead of a short crop of weeds which would require more frequent hoeing.

I have since learnt from one versed in fruit-gardening that a crop of potatoes off newly broken up land is the very best introduction for fruit trees.

Last year I mentioned what miserably small seed was supplied through the Director, Land Records, for the purpose, but as there was no alternative they had to be put in.

The plants looked *most* flourishing when last year's report was written; but in July, when they were about half-grown and ought to have been coming into flower, the whole crop suddenly blackened and died off so uniformly that it might have been the action of frost.

About half an acre of the kidney variety from seed saved from the year before was not affected but grew to maturity and gave an excellent crop, which has again been sown this year. When the crop from the small seed was dug up, the largest tubers were already as large as the original seed; but there were only 2,500 viss of them. The total crop, large and small, amounted only to 4,300 viss, and as they could not be utilized for distribution as seed, they were all offered for sale, but no buyers could be found, they were such a miserably small sample. Eventually, after considerable worry and difficulty, buyers were found for most of them, but instead of realizing Rs. 25 per 100 viss, the average selling price for an ordinary sample, they fetched an average of 10 per cent. only.

I had calculated that this crop would have paid for all the money hitherto spent on the orchard, and had the seed been good there is no reason to doubt such would have been the case; as it was they did not realize the original cost of the seed.

Not to be discouraged, however, I applied for and obtained 100 maunds more seed from the Director, Land Records, during the year. These arrived in excellent condition and were an excellent sample of kidney potato. They were most carefully stored in sheds in the same way as a similar sample received from the Pwehla Ngwegunhmu. I was in England at the sowing in March last, but I am told that the seed received from India had then wizened and shrunk very much and did not look like growing. As a fact, I am now informed that while practically every tuber from Pwehla has come up and looks *most* flourishing, those from India have only germinated here and there, perhaps 1 in 4.

The greater part are planted in the new extension of the orchard about 15 acres, and the ground was well prepared last rains while I was still in Taunggyi. If they do well, in spite of the failures in germinating there should, at any rate, be a good stock to put by for a crop next year and enough to distribute to some of the Eastern States. As there were 700 viss of the small potatoes over unsold from last year's crop, and there was spare land all ready, Mr. Leveson directed them to be sowed. They have germinated, but I am informed that they look sickly. The weight of potatoes now in the ground, when weighed as stored away, will be as follows: at sowing time when shrunk and dried and wizened, they would probably weigh less than two-thirds thus—

Supplied by Director, Land Records—

	Viss.
From India	1,940
From Pwehla Ngwegunhmu	800
Small, from last year's crop	700
	3,440

My forecast of last year's crop and probable profits was so wide of the mark that I will not attempt one this year, but there is the satisfaction of knowing that there can be no loss if the crop produces the amount of seed sown, as the labour would have to be employed in any case, even were potatoes not grown.

The Myelat cultivators returned all the seed originally supplied to them at the rate of 2 viss for 1 to cover cost of carriage and expenses, and they now owe me nothing, and the crop in the Myelat is accordingly now off my books and they do as they please.

The total receipts for potatoes was Rs. 781 and a further sum of Rs. 253 has since been credited, but will not appear in this year's accounts. To this may be added the value of the crop now in the ground on the 15 acres, but as I have not seen it, and remembering the error in the forecast for last year, I refrain from estimating its probable value.

12. *Orchard.*—On the 9th September 1892 the first sod was turned.

It now comprises a compact area of at least 36 acres (I will make a survey as soon as I am able), of which 20½ acres are fully planted up with European fruit trees interspersed with indigenous stock upon which to graft.

A good deal of money has been spent upon the formation of a tank to store the water of a spring which crops out of the foot of the hill forming the eastern boundary and which is only active for 8 months of the year.

I regret to say, however, so far I have not succeeded in getting it to hold water for long after the spring ceases to run, so that as a reservoir from which to irrigate in the dry months my money has been wasted. I have not, however, given up all hopes of still

succeeding. So far, the bund at any rate is safe and has not burst and ruined the orchard as in the case of the vegetable garden.

The whole block is fenced in with bamboo and a very pretty, but exceedingly thorny shrub, which grows largely in the Myelat called *su bo* has been sown inside the bamboo fence all round to take its place when rotten.

It is calculated to last with repairs for three years, and if the shrub goes on growing as it has commenced, no more expenditure on fencing will be necessary and it will safely defy the buffalo or even the goat. Cart tracks have been made at convenient intervals throughout and a thorough system of shallow subsoil drainage has been completed.

Fruit trees have been planted out 20 feet apart with, for the present, plantains in between at 10 feet. Most of these have already been superseded by the smaller growing trees, such as filberts, cobnuts, currant, gooseberry, &c., and all will be so superseded as spaces are required.

There are large seed-beds of the indigenous fruit trees of all sorts, including egg plum, greengage, and damson, and these will be planted out in the new extension of 15 acres next winter.

I do not propose to make any further extension though there is ample room to increase to hundreds of acres, but it appears to me now quite apparent that most of the European fruits must succeed, and having succeeded, what is now troubling me is what to do with the produce without a railway to carry these good things to the markets in Burma.

There will be absolutely no sale for them here. I fear I shall have to see them lie and rot where they grow, which will be almost as bad as a failure.

The first batch of fruit trees of all sorts received from England and India were planted in their present places in May and June last year 1893.

Some of the more vigorous of the apple, peach, and fig trees have already fruited and the fruit has mostly fallen off. Such as has not fallen I have now ordered to be plucked off. The vigour of growth, however, may be guessed by this circumstance. They were all maidens when planted.

It is now 11 months since I was able to get round to attend to them personally, and during that time I have had to work by deputy, which is most unsatisfactory. Mr. Moore, Treasury Officer, has done his best for me, and taken a great deal of trouble in the matter, but he has no knowledge whatever of the work, and the Burman in charge is the real gardener. He has, I am told, done admirably, but I refrain from attempting any report on the orchard until I have been able to inspect it myself. I may, however, say generally that I am assured by all that almost every tree planted is alive and looking most flourishing. The filberts, cobnuts, gooseberries, and currants will probably be found an exception, as I am quite prepared for a failure with these. I dare not even hope for success. The strawberries are, I am told, both numerous and most strong and healthy looking. There are many varieties—some I got as plants and some are raised from Sutton's seed, and some from seed I procured from Kew, who procured them specially from France. Out of these many seedlings some no doubt will be found to suit the soil and climate better than others. We have got to a stage now, however, where selection, classification, careful labelling, grafting, pruning, and such like refinements in the gardener's art require a trained gardener who can read and write English. I live in hopes that one may soon be sent to me. One year which can never be recalled has already been lost for pruning and grafting.

In the blank spaces in the orchard I have also experimented on Jerusalem artichokes and rhubarb.

13. *Jerusalem Artichokes and Rhubarb.*—The latter bulbs were put in as recently as October last. I am now eating most excellent rhubarb from them that could not well be excelled. The artichokes I am told are doing well.

14. *Beetroot.*—Some beetroot seed was sent me at the end of October to grow and to forward a specimen of the crop to the Director of Land Records. As the vegetable garden could not provide space for an experiment of this nature, a small quantity of the seed was sown in the orchard in November under most unfavourable conditions both as to time for sowing and preparation of soil.

The balance of the seed was put in at the commencement of the rains, which for a field crop is no doubt the only time for sowing unless it could be irrigated, and then September would be better.

A report has been submitted in my absence by Mr. Moore and some specimens of the roots as desired.

I may here remark that working as I am single-handed, with the smallest possible establishment, it is a little hard to do justice to such experiments, which to be of any value at all must be done thoroughly, and to do it thoroughly I have neither the time nor the establishment, without neglecting the many I have already in hand.

15. *Concluding remarks.*—A good deal can apparently be done at a small cost in one's leisure hours, and with the aid of the leisure hours of one's establishment.

As I am employing these in the matter of fruit trees, I do not see why the Deputy Conservator of Forests could not also do something to assist in the matter of economic

trees, many of which are probably indigenous to his charge. If he could raise young trees and plant up the roadsides, and make plantations at the outposts which would be useful and ornamental, a most desirable work would be accomplished.

At present the cart road all through the Myelat has not a tree to shade the weary cattle or travellers. The station of Thamakan might, from its surroundings, be situated at Stonehenge on the Wiltshire Downs,—not a tree or shrub for shelter from the wind or shade from the sun is there. With experimental belts of bamboos and trees, it might be made most comfortable and pretty; and instead of seeing villagers plodding from 12 to 20 miles for their firewood, it could be obtained on the spot at a profit to Government. I have instructed Mr. Giles to stir himself and the Ngwegunhmu in the matter, and at any rate to plant it around to the same extent that every village in the Myelat is obliged to plant in order to live. There is a never-ceasing high wind, it is very cold, and there is no fuel. I have authorized Mr. Giles to draw upon me for the purpose of planting belts or plantations of bamboo and mè-yom (the tún of India) and other useful or ornamental indigenous trees, to a small amount, which will be debited against this grant, but that he is to get the Ngwegunhmus to do the main work in supplying and planting the young trees. The repairs to fencing and watering, when necessary, he will have to do himself.

The Deputy Conservator of Forests might well assist at so useful a public work, and could suggest the best trees to grow for fuel or with reference to shade, beauty, quickness of growth, &c., and in part supply them.

This is offered as a suggestion, the result of carrying out which would be so exceedingly gratifying to the public who use the roads and reside at the out-stations that I fear there will be found insuperable obstacles in the way.

FORT STEDMAN: *The 28th June 1894.*

A. H. HILDEBRAND,
Superintendent and Political Officer, Southern Shan States.

STATEMENT A.—*Actual total Receipts and Disbursements from the 1st June 1893 to 31st May 1894 (year under report).*

Receipts.	Amount.			Disbursements.	Amount.		
	Rs.	A.	P.		Rs.	A.	P.
1. By budget allotment ...	4,106	3	10	1. On orchard	2,627	7	1
2. By sale of vegetables ...	92	1	4	2. On garden	147	10	0
3. By sale of potatoes ...	780	15	0	3. On potatoes	742	2	0
4. By sale of seed ...	6	0	0	4. On wheat	211	6	0
5. By sale of wheat ...	1,430	4	0				
Total ...	6,415	8	2	Total ...	3,728	9	1

STATEMENT B.—*Detail of Disbursements from the 1st June 1893 to 31st May 1894.*

Details.	Amount.		
(1) *Orchard.*	Rs.	A.	P.
(a) Establishment	545	4	7
(b) Cooly-hire for clearing jungles	313	8	0
(c) Fence of new extension—			
Cost of bamboos	109	8	0
Cooly-hire	63	4	0
(d) Cart-hire for conveying plants	44	4	0
Cooly-hire for conveying plants	75	10	0
(e) Cooly-hire for planting fruit trees	52	15	0
(f) Cost of fruit trees	601	4	0
(g) Cooly-hire for digging drains	22	15	0
(h) Cooly-hire for making shelter for young trees	17	4	0
(i) Cost of buckets	11	10	0
Carried over ...	1,857	6	7

Detail of Disbursements from 1st June 1893 to 31st May 1894—concluded.

Details.	Amount. Rs.	A.	P.
(1) *Orchard*—concluded.			
Brought forward ...	1,857	6	7
(*j*) Cooly-hire for conveying here, and cost of garden tools, repairing, and digging ...	59	10	0
(*k*) Making tank in orchard (cooly-hire) ...	184	0	0
(*l*) Purchase of two carts and fittings, ...	112	12	0
(*m*) Purchase of five cart bullocks ...	225	0	0
(*n*) Cooly-hire for making baskets ...	79	14	0
(*o*) Cooly-hire for making posts for marking acre plots ...	4	12	0
(*p*) Cooly-hire for making cart road ...	26	10	0
(*q*) Cooly-hire for herding bullocks ...	40	0	0
(*r*) Miscellaneous ...	37	6	6
Total ...	2,627	7	1
(2) *Garden.*			
(*a*) Establishment ...	108	0	0
(*b*) Purchase of seed ...	35	10	0
(*c*) Conveying vegetables to bazaar for sale ...	4	0	0
Total ...	147	10	0
(3) *Potatoes.*			
(*a*) Conveyance (cart-hire) ...	224	10	0
(*b*) Weeding (cooly-hire) ...	113	7	0
(*c*) Store sheds (cooly-hire) ...	74	4	0
(*d*) Planting potatoes (cooly-hire) ...	134	2	0
(*e*) Digging potatoes (cooly-hire) and cost of conveyance of potatoes from Thamakan ...	168	7	0
(*f*) Purchase of padlocks for godown ...	27	4	0
Total ...	742	2	0
(4) *Wheat.*			
(*a*) Sowing and reaping (cooly-hire) ...	133	13	0
(*b*) Cooly-hire for weeding ...	2	0	0
(*c*) Cost of 20 baskets for storing wheat ...	0	12	0
(*d*) Cooly-hire and cost of material for shed for storing wheat (Fort Stedman) ...	74	13	0
Total ...	211	6	0
Total of Expenditure up to 31st March 1894 (from 1st June 1893).			
1. Orchard ...	2,008	6	1
2. Garden ...	134	2	0
3. Potatoes ...	608	0	0
4. Wheat ...	133	13	0
Total ...	2,884	5	1
Total of Expenditure from 1st April 1894 to 31st May 1894.			
1. Orchard ...	619	1	0
2. Garden ...	13	8	0
3. Potatoes ...	134	2	0
4. Wheat ...	77	9	0
Total ...	844	4	0
Grand Totals from 1st June 1893 to 31st May 1894.			
(*a*) Orchard ...	2,627	7	1
(*b*) Garden ...	147	10	0
(*c*) Potatoes ...	742	2	0
(*d*) Wheat ...	211	6	0
GRAND TOTAL ...	3,728	9	1

STATEMENT C.—*List of Trees alive on the 1st July 1894 in the Government Garden, Taunggyi.*

Serial No.	Name of tree.	Saharanpur.	English.	Almora.	Madras.	North-Western Provinces.	India.	Total.
	Apple.							
1	Golden White Pearmain	...	3	...	...	...	...	3
2	Warner's King	...	3	...	...	...	...	3
3	Cox's Pomona	...	2	...	...	...	...	2
4	Blenheim Orange	1	5	...	...	...	...	6
5	Dumelous Seedling	...	3	...	...	...	...	3
6	Cox's Orange Peppins	1	5	...	...	...	...	6
7	Bramley's Seedling	...	4	...	...	...	...	4
8	Anne Elizabeth	...	3	...	...	...	...	3
9	Lord Grosvenor	...	3	...	...	...	...	3
10	Ripston Peppin	...	5	2	...	...	...	7
11	Queen	...	1	1	...	...	...	2
12	Bess Pool	...	3	...	...	...	...	3
13	Sterling Castle	...	4	...	...	...	...	4
14	Devonshire Quarenden	...	2	...	...	...	...	2
15	Worcester Pearmain	...	4	...	...	...	...	4
16	Cox's Golden Drop	1	2	...	...	...	...	3
17	Lane's Prince Albert	...	3	...	...	...	...	3
18	Exhevilla Seedling	1	4	...	...	...	...	5
19	Apple	2	3	1	2	1	...	9
20	Cashmere	2	...	...	...	...	...	2
21	Rymer	...	1	1	...	...	...	2
22	Cornish Gilliflower	...	...	3	...	...	...	3
23	Sturner Peppin	...	1	...	...	...	...	1
24	Duke of Devonshire	2	...	...	...	...	...	2
25	Hawthornden	...	...	1	...	...	...	1
26	Dutch Mignone	1	...	...	...	...	...	1
27	Pearmain Warrington	...	2	...	...	...	...	2
28	Duchess of Oldenburgh	1	...	...	...	...	...	1
29	Northern Spy	2	...	...	...	...	...	2
30	Peppin Sky House	1	...	1	...	...	...	2
31	Cornish Aromatic	2	...	...	...	...	...	2
32	Peppin Kings	1	...	...	...	...	...	1
33	Rweth Golden	...	...	1	...	...	...	1
34	Cockle Peppin	...	1	1	...	...	...	2
35	New Northern	...	1	...	...	...	...	1
	Total ...	18	68	12	2	1	...	101
	Pear.							
36	Pear	3	1	1	...	6	...	11
37	Maria Louise	2	3	...	...	...	...	5
38	Castillac	...	3	...	...	...	...	3
39	Louise Bonne	2	3	...	...	...	...	5
40	Doyende Comic	...	3	...	...	...	...	3
41	Glout Moreean	...	4	...	...	...	...	4
42	Thompson	...	...	2	...	...	...	2
43	Benne Superfine	...	2	...	...	...	...	2
44	Victoria	2	...	...	...	...	...	2
45	Flemish Beauty	3	...	1	...	...	...	4
46	Jargonelle	2	5	...	...	...	...	7
47	Pitsmastons Duchesse	...	3	...	...	...	...	3
48	Easter Benne	...	3	...	...	...	...	3
49	Huyshe's Bergamot	2	...	...	...	...	...	2
50	Bergamot d'Esperins	1	1	...	...	...	...	2
51	The Queen	...	1	...	...	...	...	1
52	W. Bon Cretunne	...	2	...	...	...	...	2
53	Winter Nelis	...	3	...	...	...	...	3
54	Louise Bonne Jursey	...	2	...	...	...	...	2
55	China	1	...	...	...	...	...	1
	Total ...	18	39	4	...	6	...	67
	Carried forward ...	36	107	16	2	7	...	168

List of Trees alive on the 1st July 1894 in the Government Garden, Taunggyi—contd.

Serial No.	Name of tree.	Saharanpur.	English.	Almora.	Madras.	North-Western Provinces.	India.	Total.
	Brought forward ...	36	107	16	2	7	...	168
	Plum.							
56	Plum	1	3	2	1	1	...	8
57	Kabul Greengage	1	...	...	...	...	...	1
58	Gulhries Late Greengage	2	...	...	...	...	...	2
59	Prince Englebert	1	6	...	...	...	...	7
60	Prince Claude de Molett	2	...	...	...	...	...	2
61	Jafferson	2	7	...	...	...	...	9
62	Washington	1	...	...	...	...	...	1
63	Victoria	...	6	...	...	...	...	6
64	Early Prolific	2	6	...	...	1	...	9
65	New Northern Greengage	...	1	...	...	...	...	1
66	Alucha, Black	1	...	...	...	...	...	1
67	Alucha, Red	1	...	...	...	...	...	1
68	Alucha, Large	1	...	...	...	...	...	1
69	Crettenden Damson	...	1	...	...	...	...	1
70	Black Diamond	...	6	...	...	...	...	6
71	Reine de Bavay	1	...	...	...	...	...	1
72	Golden Drop	3	4	...	...	...	...	7
73	Dwarf Early Yellow	1	...	...	...	...	...	1
74	Brushy's Greengage	...	...	1	...	...	...	1
75	Greengage	...	6	1	...	...	...	7
76	Smith's Purple Prolific	...	3	...	...	...	...	3
77	Cox's Golden Drop	...	2	...	...	...	...	2
78	Denniston's Superb	...	6	...	...	...	...	6
79	Golden Gage	2	...	...	...	...	...	2
80	Alu-bu-khara, small	1	...	...	...	...	...	1
81	Golden Asparic	1	...	...	...	...	...	1
82	Prune	1	..	...	...	...	...	1
83	Large yellow	1	...	...	...	...	...	1
	Total ...	26	57	4	1	2	...	90
	Cherry.							
84	Cherry, May Duke	...	6	...	...	...	...	6
85	Beganeau Napoleon	...	6	...	...	...	...	6
86	Elton	...	6	...	...	...	...	6
87	Werder's Early Black	...	8	...	...	...	...	8
88	Beganeau	...	6	...	...	...	...	6
89	Kentish	...	6	...	...	...	...	6
90	Knight's Early Black	...	6	...	...	...	...	6
91	Cherry	...	1	...	...	...	...	1
92	Florence	...	6	...	...	...	...	6
93	Morella	...	5	...	...	...	...	5
	Total ...	...	56	...	...	...	...	56
	Peach.							
94	Peach	...	1	2	4	4	1	12
95	Early Rivers	...	...	9	...	...	...	9
96	Large Agra	2	...	...	...	...	...	2
97	Hardai	1	...	...	...	...	...	1
98	Violet Haline	...	3	...	...	...	...	3
99	Country	8	...	...	...	...	...	8
100	Nectarine	...	...	1	...	...	...	1
101	Rhenny Shepston	...	...	1	...	...	...	1
102	Dr. Hogg	...	...	2	...	...	...	2
103	Honey	...	...	2	...	...	...	2
104	China Flat	2	...	...	...	...	...	2
105	Grosse Mignomne	...	3	...	...	...	...	3
106	Sterling Castle	1	...	1	...	...	...	2
107	Anderson's Spring	...	...	1	...	...	...	1
	Carried over ...	14	7	19	4	4	1	49
	Carried forward ...	62	220	20	3	9	...	314

List of Trees alive on the 1st July 1894 in the Government Garden, Taunggyi—contd.

Serial No.	Name of tree.	Saharanpur.	English.	Almora.	Madras.	North-Western Provinces.	India.	Total.
	Brought forward ...	62	220	20	3	9	...	314
	Peach—concluded.							
	Brought forward ...	14	7	19	4	4	1	49
108	Early York	...	...	1	...	...	...	1
109	Prince of Wales	...	2	...	...	...	...	2
110	Belle Garde	...	2	...	...	...	...	2
111	Anderson Noblesse	...	2	...	...	...	...	2
112	Royal George	...	3	...	...	...	...	3
113	Crimson Galande	...	3	...	...	...	...	3
114	Hakin	1	...	...	...	...	...	1
115	Alexandria Noblesse	...	1	...	...	...	...	1
	Total ...	15	20	20	4	4	1	64
	Apricot.							
116	Apricot Hamskirk	2	5	...	...	...	...	7
117	Royal	...	...	4	...	...	...	4
118	Moor Park	2	5	5	...	1	...	13
119	Apricot	...	7	2	...	1	...	10
120	Large Early	...	4	...	...	...	...	4
121	New Large Early	...	...	2	...	...	...	2
122	Cashmere	3	...	...	...	...	...	3
123	Brussels	2	...	...	...	...	...	2
124	Early Orange	1	...	1	...	...	...	2
125	Frogmore Early	...	1	1	...	...	...	2
126	Golden Drop	2	...	...	...	...	...	2
127	Mexican	2	...	...	...	...	...	2
	Total ...	14	22	15	...	2	...	53
	Nectarine.							
128	Nectarine Claremont	2	...	...	...	...	...	2
129	Peach	...	...	2	...	...	...	2
130	Kabul	1	...	...	...	...	...	1
131	Nectarine	...	1	1	...	2	...	4
132	Nurray	2	...	...	...	...	...	2
133	Elruge	...	3	...	...	...	...	3
134	Lord Napier	...	3	...	...	...	...	3
135	Pitsmaston Orange	...	3	...	...	...	...	3
136	New White	2	...	...	...	...	...	2
137	Hardwicks Early	...	4	...	...	...	...	4
	Total ...	7	14	3	...	2	...	26
	Currant.							
138	Currant, Red Dutch	...	22	...	...	...	...	22
139	Raby Castle	...	10	...	...	...	...	10
140	Black Naples	...	10	...	...	...	...	10
141	Lees Prolific Black	...	2	...	...	...	...	2
	Total ...	...	44	...	..	...	...	44
	Gooseberry.							
142	Gooseberry, Crown Bob	...	7	...	...	...	...	7
143	Gooseberry	...	1	...	...	...	...	1
144	White Smith	...	11	...	...	...	...	11
145	Warrington	...	4	...	...	...	...	4
146	Whitehams Industry	...	8	...	...	...	...	8
	Total ...	...	31	...	...	...	...	31
	Carried over ...	98	351	58	7	17	1	532

List of Trees alive on the 1st July 1894 in the Government Garden, Taunggyi—concld.

Serial No.	Name of tree.	Saharanpur.	English.	Almora.	Madras.	North-Western Provinces.	India.	Total.
	Brought forward ...	98	351	58	7	17	1	532
	Vine.							
147	Vines, Miss Pearson	...	...	1	...	...	...	1
148	Trentham Black	...	...	2	...	...	...	2
149	West, St. Peter	...	...	3	...	...	...	3
150	Vines	...	1	...	...	...	...	1
151	Grosse Calmar	...	...	2	...	...	...	2
	Total ...	...	1	8	...	...	...	9
	Fig.							
152	Fig	...	3	3	...	...	...	6
	Total ...	...	3	3	...	...	...	6
	Nut.							
153	Walnut	...	5	6	...	3	...	14
154	Cobnut	...	4	...	...	...	...	4
155	White Filbert	...	10	...	...	...	...	10
	Total ...	...	19	6	...	3	...	28
	Total of 1 to 155 ...	98	374	75	7	20	1	575
156	Two trees (doubtful)	...	...	...	...	...	...	2
157	Plantain	...	...	...	...	...	...	421
158	Orange trees	...	...	...	...	...	...	240
159	Peach stock	...	...	...	...	...	...	219
160	Apple stock	...	...	...	...	...	...	272
161	Pear stock	...	...	...	...	...	...	164
162	Plum stock	...	...	...	...	...	...	29
163	Nectarine stock	...	...	...	...	...	...	19
164	Cherry stock	...	...	...	...	...	...	2
	Total ...	...	...	...	...	...	...	1,368
	GRAND TOTAL ...	98	374	75	7	20	1	1,943

STATEMENT II-A.

Distribution list of seed obtained for experimental cultivation during 1893-94.

No.	How distributed.		Maize. (a)		Tobacco. (b)		Vegetable Seeds. (c)		Wheat. (d)		Potato. (e)	
	Districts.	Designation or name of officer receiving seed.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity	Date.
1	2	3	4	5	6	7	8	9	10	11	12	13
			Cobs.		lbs.		lbs.		Bkts.		Maunds.	
1	Ma-ubin ...	Deputy Commissioner...	...	...	...	...	3	26-9-93	...	...	...	...
2	Amherst ...	Commissioner ...	...	...	6	7-7-93	...	...	...	...	1	21-1-94
3	Tavoy ...	Deputy Commissioner ...	30	18-5-93	...	...	...	...	...	...	...	...
4	Tavoy ...	Revd. H. Morrow ...	24	16-6-93	...	...	...	...	...	...	...	...
5	Tavoy ...	Mr. J. D. Watson ...	19	16-6-93	...	...	...	...	...	...	...	...
6	Toungoo ...	Mr. J. Petley ...	30	11-5-93	...	...	...	...	...	...	...	...
7	Shwegyin ...	Deputy Commissioner...	40	...	...	...	...	...	...	...	...	...
8	Thayetmyo ...	Deputy Commissioner...	35	18-5-93	...	...	...	...	...	...	...	...
9	Pakôkku ...	Deputy Commissioner...	80	...	...	...	3	26-9-93	...	...	...	...
10	Minbu ...	Deputy Commissioner...	50	...	...	...	...	...	...	...	...	...
11	Mâgwe ...	Deputy Commissioner...	60	...	10	5-7-93	3	26-9-93	...	...	1 maund	23-1-94
12	Mandalay ...	Deputy Commissioner...	120	13-5-93	12	5-7-93	3	26-9-93	...	...	...	...
13	Mandalay ...	Mr. H. N. Hirji ...	50	11-5-93	6	5-7-93	...	...	...	...	...	...
14	Bhamo ...	Deputy Commissioner...	...	...	...	...	3	26-9-93	2	28-11-93	1	30-1-94
15	Katha ...	Deputy Commissioner...	...	...	...	...	3	26-9-93	4	28-8-93	1	23-1-94
16	Shwebô ...	Deputy Commissioner...	40	11-5-93	...	...	3	26-9-93	...	...	...	...
17	Ruby Mines ...	Deputy Commissioner...	60	13-5-93	...	...	...	...	5	26-9-93	...	...
18	Ye-u ...	Deputy Commissioner...	60	13-5-93	...	...	3	26-9-93	...	...	...	...
19	Sagaing ...	Commissioner, Central Division.	30	11-5-93	...	...	3	26-9-93	...	...	...	...
20	Sagaing ...	Deputy Commissioner ...	50	...	6	5-7-93	...	...	...	...	...	...
21	Lower Chindwin	Deputy Commissioner...	50	18-5-93	...	...	3	26-9-93	...	...	...	...
22	Upper Chindwin	Deputy Commissioner...	50	...	...	...	3	26-9-93	...	...	...	...
23	Kyauksè ...	Deputy Commissioner ..	65	11-5-93	...	...	...	...	...	...	...	...
24	Meiktila ...	Deputy Commissioner...	70	13-5-93	...	...	...	...	...	...	...	...
25	Yamèthin ...	Deputy Commissioner...	170	13-5-93	...	...	...	...	...	...	...	...
26	Myingyan ...	Deputy Commissioner...	15	18-5-93	...	...	...	...	...	...	...	...
27	Fort Stedman	Superintendent, Southern Shan States.	70	11-5-93	...	...	...	...	* 800 maunds or 1,008 baskets.	14-8-93	100 maunds	15-10-93
28	Chin Hills (Haka).	Political Officer ...	...	...	...	...	3	26-9-93	...	...	...	...
		Total ...	1,268	...	40	...	36	...	1,019 baskets	...	104	...

(a) American maize. (b) American tobacco. (c) English vegetable seeds.
(d) Sagaing and North-West Provinces wheat. (e) North-West Provinces potato seeds.
* Recoverable as an agricultural advance.

STATEMENT II-B.

Statement showing description and quantity of seeds received together with the cost of consignment and of distribution during 1893-94.

Seed.		From	Received.	Cost of consignment.	Cost of distribution.
Description.	Quantity.				
				Rs. A. P.	Rs. A. P.
Maize ...	1,268 cobs ...	America (D. Landreth & Son, Philadelphia) ...	24-2-93	623 11 0	36 8 0
Tobacco ...	40 lbs. ...			.....	5 4 0
Vegetable ...	36 " ...	England (Sutton & Sons)	6-9-93	219 4 8	9 12 0
Wheat ...	1,019 baskets...	North-West Provinces, Sagaing (Deputy Commissioner).	26-9-93 28-8-93 28-11-93 14-8-93	8,003 2 0(a)	.....
Potato ...	104 maunds ...	Calcutta (Secretary, Agri-Horticultural Society)	15-10-93	574 0 0	22 10 0
				9,420 1 8	74 2 0

(a) Recoverable as agricultural advances.

STATEMENT III-A.

Experimental cultivation—American Maize.

Serial No.	District.	Particulars regarding experiment.	Result of experiment.
1(a)	Tavoy ...	Planted in June—Loamy soil, flat surface.	Failure—Excessive rain and attacks of insects prevented crop coming to maturity.
1(b)	Tavoy ...	Planted in rains; grown by Mr. Watson.	Failed; seed germinated, but plants killed by heavy rain.
1(c)	Tavoy ...	Experiment by the Revd. H. Morrow. Some planted in June and some in October. Later crop watered.	Early crop germinated, but was destroyed by heavy rain. Later crop gave excellent results.
2(a)	Toungoo ...	Distributed to Burmese cultivators.	Sown too late and destroyed by vermin. Good results, however, from seed reserved from last year's crop.
2(b)	Toungoo ...	Grown by Mr. Petley ...	Portion of crop destroyed by rats and vermin. Portion produced excellent cobs.
3(a)	Shwegyin ...	Planted in June and October. High and sloping ground.	Failure—Seed did not germinate; said to be too old.
3(b)	Shwegyin ...	Planted in June in the jail garden.	Good cobs obtained, but destroyed by parrots.
3(c)	Shwegyin ...	Planted in early rains; grown by ordinary cultivators.	Did not germinate.
3(d)	Shwegyin ...	Distributed by myoôks to a number of cultivators.	Entire failure.
4	Mandalay ...	.....	Failure in Pyinulwin, Singu, and Amarapura. Partial success in Madaya.
5	Shwebo ...	(1) Rich loamy soil in Kanbalu (2) Light clayey soil—watered.	Partial success. Failed.
6	Ruby Mines ...	Planted in early rains ...	Failure—Said to be planted too late.
7	Sagaing ...	.....	Failed in Myinmu and Ava, but succeeded in Sagaing.
8	Ye-u	Heavy hard soil; planted September to December. Soft cotton soil; planted September to December. High lying hard soil ...	Failed. Damaged by drought, but fairly successful. Failed—Crop eaten by insects.
9	Lower Chindwin ...	Planted in June, July, August on various soils.	Most of experiments failed; but in two cases, one on loamy and one on clayey soil, good crops were obtained. In most cases manure was used.
10	Upper Chindwin ...	Planted by Deputy Commissioner and by Superintendent of Jail.	Failed almost entirely. Failure attributed to bad seed.
11	Thayetmyo ...	.....	Failure—Seed did not germinate; said to be too old.
12	Minbu ...	.....	Portion destroyed by inundation and rest by blight.
13	Pakôkku ...	Grown in dark coloured loamy soil; not manured or irrigated; planted in September.	Destroyed by heavy rain.
14	Kyauksè ...	Grown by thugyis of seven villages.	In five cases floods destroyed crop; in one case young plants were destroyed by grasshoppers, and in the last case plants withered as soil was too sandy.
15	Meiktila ...	Distributed to 12 thugyis ...	Failed in every case.
16	Yamèthin ...	.....	Only very partial success. People said to prefer indigenous varieties as American seed is coarse and unpalatable.
17	Myingyan ...	Distributed to myoôks ...	Failed—Young plants withered away.
18	Agri-Horticultural Society, Moulmein.	Distributed to cultivators and others.	The yellow or red variety was a failure, but the white variety was a success. The American cob supplied weighed nine ounces, while the sample produced weighed over eight ounces.

STATEMENT III-B.

Experimental cultivation—American Tobacco seed distribution.

No.	District.	Particulars regarding experiment.	Result of experiment.
1	Amherst ...	Agri-Horticultural Society, Tenasserim.	Not planted. Said to be received too late.
2	Mandalay ...	Alluvial soil, low flat; grown by Mr. Hirji.	Failure—Portion germinated, but apparently planted too late.
2(*a*)	Mandalay ...	Alluvial soil. Planted in July	Seeds did not germinate in most cases, and in others the plants died off when still small.
3	Sagaing ...	Distributed in Ava and Myinmu subdivisions.	Failed, except at Kyauktalôn, where experiment was a partial success.
4	Magwe ...	Planted in early rains, except in Taungdwingyi, where it was sown in September and October. Never manured or watered.	Failure—Early plantings said to be destroyed by excessive rain. Late plantings withered.

STATEMENT III-C.

Experimental cultivation—English Vegetable Seeds—Seed distribution.

No.	District.	Particulars regarding experiment.	Result of experiment.
1	Mandalay ...	.....	Failed through ignorance of cultivators.
2	Shwebo ...	Sown in Myedu and Chaukywa and in jail garden.	In Chaukywa land not fertilized and experiment failed. In Myedu a small proportion of commonest sorts succeeded. Failure attributed to want of supervision.
3(*a*)	Bhamo ...	Rich loam not manured; grown by myoôks and myothugyis.	Cabbage, beans, knol-kohl, turnips, beet, and lettuce very successful.
3(*b*)	Bhamo ...	Rich loam, flat ground, on river bank. Planted about December.	Turnips, radishes, and carrots were a success. Onions, tomatoes, and beans failed.
3(*c*)	Bhamo ...	Heavy loam, low lying, and flooded in the rains.	Failed—Failure attributed by Subdivisional Officer to bad seed.
4	Katha ...	Irrigation from wells ...	Cabbage, lettuce, carrots, turnips, and tomatoes did well. Beans, peas, and cauliflower were fair; onions failed.
5	Lower Chindwin ...	.....	Fairly successful. Lettuce, turnips, peas and water-melons turned out fairly well; radishes, large and coarse; cabbage and carrots, small; cauliflower and brocoli fair; onions did well. Celery, knol-kohl, tomatoes and beans good.
6	Upper Chindwin ...	Grown in jail garden ...	Peas, lettuce, tomatoes, and carrots gave excellent results; radishes and other seeds fair.
7	Pakôkku ...	Sandy soil, planted in jail garden.	Tomatoes, radishes, and carrots great success. Other seeds failed.
8	Magwe ...	Grown by Superintendent of Jail, Taungdwingyi; Subdivisional Officers, Magwe and Yenangyaung.	The Taungdwingyi experiment was a success except as regards celery, asparagus, and brocoli. At Magwe the experiment failed from want of water, and at Yenangyaung the seeds were planted too late.
9	Ma-ubin ...	.....	The experiment proved perfectly successful and gave a good outturn.

STATEMENT III-D.

Experimental cultivation—Wheat.

No.	District.	Particulars regarding experiment.	Result of experiment.
1	Bhamo	Seed returned and sold off as received too late for purposes of experiment.	.....
2	Katha	.....	Report not received.
3	Ruby Mines	.....	Failure owing to late sowing and extreme richness of soil.

STATEMENT III-E.

Experimental cultivation—Potatoes.

No.	District.	Particulars regarding experiment.	Result of experiment.
1	Moulmein ... ... Amherst	.....	Report not received.
2	Katha	.....	Germinated well and an abundant outturn was expected, but just as the plants were maturing rats destroyed the entire crop.
3	Ruby Mines	.....	Planted in March. A good crop obtained in June and July. Out of this, seed for next season's sowing has been kept in store.
4	Magwe	Sown on sandy, alluvial soil ...	Young plants destroyed by ants. Outturn poor.

STATEMENT IV.

Agricultural Shows—Prize List.

Nature of exhibits.	Prizes. *Kyónpyaw.* First.	Second.	Third.	*Moulmein.* First.	Second.	Third.	*Mingin.* First.	Second.	Third.	Fourth.	Fifth.	Remarks.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
(i) *Cattle.*												
1. Best pair buffaloes ...	...	30	...	30	15	...	10	...	...	...	...	
2. Best pair bullocks ...	50	30	20	30	15	...	8	...	...	...	...	
3. Best bull (bullock) ...	...	...	...	10	10	10	...	...	...	...	...	
4. Best bull (buffalo) ...	...	...	...	20	10	...	...	...	...	...	...	
5. Best milch-cow	10	...	...	20	...	...	5	...	...	...	...	
6. Best pony	40	...	...	...	...	...	...	...	...	...	...	
7. Best mare and foal ...	...	...	...	...	...	...	30	(a)20	...	...	...	(a) Mare only.
(ii) *Poultry.*												
8. Best pair ducks	...	...	...	5	...	...	...	...	...	...	...	
9. Best pair fowls	10	...	...	5	...	...	...	...	...	...	...	
10. Best collection of poultry ...	...	...	...	...	...	...	(b)10	...	...	...	...	(b) Fowls ... Rs. Geese ... 5 Pigeons ... 2
(iii) *Staple and other foods.*												
11. Best sample paddy (kyaukkyé)...	15	10	10	10	...	...	5	5	...	...	...	
12. Best sample paddy (mayin) ...	...	...	...	...	...	...	5	...	...	...	...	
13. Best sample paddy (yabine) ...	...	...	...	...	10	...	...	...	...	...	...	
14. Best sample paddy (shangale) ...	...	...	...	...	...	10	...	...	...	...	...	
15. Best wheat	...	...	...	...	...	...	10	...	...	...	...	
16. Best Indian-corn	...	...	...	...	...	...	...	...	...	...	...	No exhibits.
17. Best millets	...	...	...	...	...	...	(c)10	...	...	...	...	(c) Sai ... Rs. 5 Tu ... 5
18. Best til seed	...	...	...	10	...	...	...	...	...	...	...	
19. Best collection of vegetables ...	5	...	...	10	10	10	(d)22	...	...	...	...	(d) Brinjals ... Rs. 3 Vegetable marrow 1 Peas 3 & 2 Tomatoes ... 2 English onions ... 3 English vegetables ... 5 & 3
20. Best collection of fruits ...	...	...	...	5	5	...	...	...	...	...	...	
(iv) *Other agricultural produce.*												
21. Best garden	25	...	...	...	...	...	...	...	...	...	...	
22. Best tobacco plant	...	...	...	...	...	...	3	2	...	...	...	
23. Best tobacco leaf (cured) ...	...	...	...	10	...	...	3	2	...	...	...	
(v) *Raw materials.*												
24. Best raw silk	...	...	...	...	...	...	5	...	...	...	...	
25. Best raw cotton	...	...	...	...	...	...	3	...	...	...	...	
26. Best silk and cotton cloths ...	...	...	...	...	...	...	5	3	2	2	1	
(vi) *Forest produce.*												
27. Best wood-oil	...	...	...	...	...	...	5	...	...	...	...	
28. Best wax	...	...	...	...	...	...	} 5	...	...	...	...	
29. Best honey	...	...	...	...	...	...						
30. Best coal	...	...	...	...	...	...	5	...	...	...	...	
31. Best earth-oil	...	...	...	...	...	...	5	...	...	...	...	
(vii) *Agricultural implements.*												
32. Best agricultural implements ...	5	...	...	...	...	...	...	...	...	...	...	
(viii) *Miscellaneous.*												
33. Best mats	...	...	...	6	5	...	2	...	...	...	...	
34. Best jewellery	...	...	...	...	...	...	8	2	...	...	...	
35. Best brass-wire	...	...	...	...	...	...	5	...	...	...	...	
36. Best pottery	...	...	...	...	...	...	5	3	2	...	...	
37. Best drugs	...	...	...	...	...	...	2	1	...	...	...	
38. Best fishery-dog ...	...	...	...	...	...	...	...	...	...	...	...	
Total Prizes ...	160	70	30	171	80	30	176	38	4	2	1	=762
Contingencies ...	...	...	...	...	...	...	...	...	...	...	...	=228
GRAND TOTAL ...	...	...	...	...	...	...	...	...	...	...	...	=990

STATEMENT V.

Schedule of normal prices of food-grains per 100 9-gallon baskets for each month of the year excluding abnormally high or low prices.

	District.	Paddy.												Rice.												Jowar.											
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Lower Burma.	Akyab	63	66	73	73	72	72	78	80	80	80	80	74	178	154	148	176	176	176	176	178	178	178	178	178	...	...	...	...	...	...	...	...	...	...	...	...
	Kyaukpyu	61	67	72	71	79	94	111	100	97	103	103	100	225	225	230	250	220	220	212	270	265	230	230	230	...	...	...	...	...	...	...	...	...	...	...	...
	Sandoway	56	56	59	66	72	87	89	77	75	71	72	68	185	210	210	250	300	300	380	350	350	207	202	185	...	...	...	...	...	...	...	...	...	...	...	...
	Rangoon	87	87	85	91	94	103	104	104	115	103	100	83	254	261	258	269	277	271	286	290	305	301	335	275	...	...	...	...	...	...	...	...	...	...	...	...
	Pegu	79	82	81	86	93	92	100	102	113	110	81	78	376	354	358	402	352	412	414	364	364	404	418	418	...	...	...	...	...	...	...	...	...	...	...	...
	Tharrawaddy ...	77	74	78	81	01	95	98	98	111	83	83	72	282	293	286	304	316	316	316	316	303	337	368	292	...	...	...	...	...	...	...	...	...	...	...	...
	Prome	77	81	82	85	92	93	101	98	99	99	93	82	230	248	248	264	270	250	272	274	265	296	202	214	...	...	...	...	...	...	...	...	...	...	...	...
	Bassein	78	80	84	88	94	93	100	99	104	91	96	82	237	237	237	225	225	225	250	300	287	250	202	262	...	...	...	...	...	...	...	...	...	...	...	...
	Thôngwa	83	79	85	90	92	100	103	103	103	113	105	99	350	350	350	350	300	300	300	362	325	350	400	400	...	...	...	...	...	...	...	...	...	...	...	...
	Henzada	83	84	88	94	99	102	104	113	115	104	93	85	231	326	310	350	337	325	350	322	307	350	325	292	...	...	...	...	...	...	...	...	...	...	...	...
	Myaungmya ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Thayetmyo... ...	92	88	95	102	106	108	105	106	119	117	111	95	250	225	230	...	...	...	...	...	...	...	325	300	...	...	...	...	...	...	...	...	...	...	...	...
	Amherst	80	82	87	94	95	94	99	107	111	110	91	89	333	300	300	350	362	375	362	350	350	372	417	367	...	...	...	...	...	...	...	...	...	...	...	...
	Shwegyin	77	75	81	84	86	88	95	91	103	110	109	87	300	275	250	287	287	262	344	308	308	302	362	325	...	...	...	...	...	...	...	...	...	...	...	...
	Toungoo	76	74	75	79	73	95	97	99	88	95	93	85	250	250	249	308	284	275	281	287	319	315	312	281	...	...	...	...	...	...	...	...	...	...	...	...
	Tavoy	78	79	76	83	83	94	96	91	116	105	97	92	217	227	253	275	275	275	275	275	383	270	247	240	...	...	...	...	...	...	...	...	...	...	...	...
	Mergui	87	84	83	90	98	101	104	115	112	115	104	93	225	275	232	235	230	295	295	295	...	260	230	240	...	...	...	...	...	...	...	...	...	...	...	...
Upper Burma.	Mandalay	91	93	87	94	98	98	99	94	99	107	100	92	267	249	264	266	274	252	261	262	283	291	301	296	100	100	70	50	72	70	65	65	80	73	60	53
	Bhamo	86	84	84	87	97	100	101	105	107	103	100	89	275	280	285	303	290	292	297	277	255	283	233	243	...	...	...	...	...	...	...	...	...	...	...	...
	Katha	73	75	78	77	82	87	91	92	92	86	84	70	244	257	249	273	294	292	287	315	290	258	271	203	...	...	...	...	...	...	...	...	...	...	...	...
	Shwebo	81	84	91	95	94	94	100	102	99	93	82	81	270	275	271	271	252	261	291	281	292	302	280	250	...	...	...	...	...	...	...	...	...	...	...	...
	Ruby Mines ...	195	180	195	187	200	205	263	242	225	208	200	200	566	477	564	687	750	752	643	812	1,025	988	687	640	...	...	...	...	...	...	...	...	...	...	...	...
	Ye-u	75	76	73	80	81	82	85	86	89	87	81	78	215	243	243	243	281	282	279	270	261	225	167	192	...	...	...	...	...	...	...	...	...	...	...	...
	Sagaing	90	85	88	93	91	96	96	101	98	88	97	85	278	281	267	285	270	270	283	276	287	276	268	292	85	77	77	80	85	75	112	100	100	65	60	...
	Lower Chindwin ...	92	90	94	95	99	100	103	112	111	108	97	102	270	350	300	360	360	333	300	359	389	375	317	317	60	64	70	72	72	77	85	84	95	86	85	62
	Upper Chindwin ...	58	58	65	65	64	63	58	67	62	62	61	69	325	312	325	269	302	332	332	353	306	255	350	295	...	...	...	...	...	...	...	...	...	...	...	...
	Myingyan	94	94	97	100	95	100	109	112	113	112	102	97	320	315	252	282	282	322	318	331	322	338	335	325	145	130	125	120	120	120	120	122	149	132	140	100
	Pakôkku	98	100	103	105	108	105	112	112	109	109	105	101	350	352	350	335	377	348	377	330	332	321	343	319	80	115	100	...	100	100	117	100	90	95	105	100
	Minbu	102	102	101	96	98	100	104	109	107	106	107	99	345	335	290	300	290	296	285	273	240	243	250	275	78	77	80	96	84	85	103	85	102	97	95	80
	Magwe	98	98	99	100	105	106	102	107	104	104	90	95	300	300	275	300	250	250	240	240	220	230	275	283	85	77	...	100	125	120	100	90	100	100	100	...
	Kyauksè	79	77	88	87	86	84	89	80	79	77	76	77	234	235	235	235	200	212	239	230	238	248	246	211	...	...	...	...	...	...	...	...	...	...	...	...
	Meiktila	95	92	97	99	100	100	99	99	106	112	106	104	337	347	357	295	304	304	304	294	310	363	334	334	102	96	102	82	84	75	75	93	75	87	88	92
	Yamethin	77	80	77	78	80	85	92	86	90	93	81	68	331	397	331	290	327	318	295	324	343	340	340	323	...	...	50	50	...	...	...	...	...	...	...	...

STATEMENT VI.

Annual Famine Statement C for Burma for the year 1893-94.

Division.	District.	Population.	Maximum number of persons for whom relief works may be required.	Number of persons provided for daily for three months.			Description, without details, of the general character and utility of the works under each head and of the prospects of their completion either within or soon after the period of scarcity.
				Large works for which professional agency is required.	*Others.*		
					Simple works.	Works near villages.	
1	2	3	4	5	6	7	8
PEGU	Tharrawaddy ...	347,454	4,000	9,000	1,000	...	Scarcity exceedingly improbable, but just possible in a few circles. Works include roads, tanks, and irrigation canals.
	Prome ...	360,252	30,000	20,000	10,000	...	Three irrigation works which provide for bunding streams and digging canals, thus bringing considerable areas under cultivation. Three works are roads forming useful communications. Some forest works have also been proposed. Works might be finished quickly if scarcity severe.
IRRAWADDY ...	Thayetmyo ...	250,161	20,000	39,000	1,000	...	Works include roads, irrigation works, and canals. The roads form useful communications. Work might be finished in time stated.
NORTHERN	Mandalay ...	374,060	25,000	15,000	2,000	...	The works are the inner bund, Mandalay, nine roads of 141 miles in length, five roads of 49 miles in length, and a tank at Tamakso,—all useful works recommended by the Public Works Department. Most of the works might be finished within the period of scarcity.
	Bhamo ...	92,660	1,000	1,000	...	...	Works consist of roads. People would probably emigrate in preference to working on relief works.
	Katha ...	115,411	*Nil.*	...	...	...	No famine at all likely. Railway can supply works for all persons who might require it.
	Shwebo ...	135,255	25,000	34,000	...	...	Works include roads, remodelling canals, constructing weirs, and repairing tanks. Most of the works could be finished in the time stated if labour available.
	Ruby Mines ...	26,134	*Nil.*	...	...	...	.....
CENTRAL	Ye-u ...	92,549	30,000	18,000	...	...	Works include roads, tanks, and repairing bunds—all useful and beneficial; and could be completed with the labour available.
	Sagaing ...	248,207	33,000	22,000	...	...	All the works are near villages and include roads, tanks, canals, and weirs.
	Lower Chindwin ...	232,245	70,000	74,000	8,000	...	Works include a number of roads and irrigation works—all useful and beneficial.
	Upper Chindwin ...	97,793	20,000	46,000	...	...	Works include some very important roads, but scarcity very improbable.
SOUTHERN	Myingyan ...	351,411	130,000	25,000	4,000	5,000	Works include roads, tanks, and irrigation works. All useful and beneficial works.
	Pakôkku ...	303,753	50,000	50,000	...	...	Relief works consist of construction and repair of six roads. All useful lines of communication. Works might be finished soon after period of scarcity.
	Minbu ...	224,475	50,000	85,000	2,000	...	Works consist of roads, opening out lines of communication, making irrigation tanks, and constructing canals.
	Magwe ...	219,190	30,000	56,000	8,000	...	Works include five roads and ten irrigation schemes, all useful and beneficial, which might be finished within six months.
EASTERN	Meiktila ...	206,650	69,000	58,000	5,000	10,000	Works include roads and irrigation works. Former required for opening out the district. All beneficial and could be completed soon after three months.
	Yamèthin ...	160,662	104,000	29,000	3,000	23,000	There are 41 roads and 54 irrigation works under column 4. Village works are nearly all connected with tanks. All work beneficial to people employed. They could probably be completed shortly after period of scarcity, if the scarcity were severe.
	Pyinmana ...	56,349	7,000	14,000	...	...	Scarcity extremely improbable. Works include roads, the earthwork of which could be completed in about three months, but bridging would probably take five or six months more. Roads are very necessary.
	Total ...	3,894,671	698,000	595,000	44,000	38,000	

STATEMENT

General Statistics relating to Government

Division.	Station at which school is established.	District for which established.	Monthly rate of schooling fee.	NUMBER OF PUPILS ON THE ROLLS — On the 30th September 1893. — Paying pupils. — Scholarship-holders.	Others.	Free pupils.	Total.	On the 31st March 1894. — Paying pupils. — Scholarship-holders.	Others.	Free pupils.	Total.	Average number on the rolls monthly during the year.	Average daily attendance.	CLASSIFICATION OF PUPILS — On the 30th September 1893. — Burmans and Karens.	Others.	On the 31st March 1894. — Burmans and Karens.	Others.	Number of scholarships at Rs. 10 allowed under old rules.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	LOWER BURMA.		Rs.															
Arakan.	Akyab ...	Akyab and Arakan Hill Tracts	1	2	14	...	16	2	13	...	15	16	14	16	...	14	1	12
	Kyaukpyu ...	Kyaukpyu and Sandoway ...	1	1	6	5	12	4	7	1	12	10	6	12	...	12	...	
Pegu.	Rangoon ...	Hanthawaddy	2	1	24	...	25	...	22	...	22	15	14	25	...	22	...	6
	Pegu ...	Pegu	2	5	13	...	18	5	4	...	9	13	11	18	...	11	...	8
	Tharrawaddy ...	Tharrawaddy	2	2	20	8	30	4	12	3	19	20	17	30	...	19	...	4
	Prome ...	Prome	2	2	20	4	26	2	15	1	18	15	13	26	...	17	1	4
Irrawaddy.	Ma-ubin ...	Thôngwa	2	7	25	...	32	7	13	2	22	28	25	32	...	20	...	7
	Bassein ..	Bassein and Myaungmya ...	2	8	10	7	25	8	9	5	22	20	20	25	...	22	...	8
	Henzada ...	Henzada	2	5	18	...	23	5	8	...	13	17	14	23	...	12	1	5
Tenasserim.	Moulmein ...	Amherst and Saiween ...	1	2	10	...	12	...	13	...	13	11	9	12	...	12	1	8
	Tavoy *a* ...	Tavoy and Mergui ...	...	...	...	...	...	...	19	...	19	11	12	..	...	19	...	6
	Toungoo ..	Toungoo and Shwegyin ...	1	3	29	...	32	6	26	..	32	27	26	32	...	31	1	6
4	12	18	1—2	38	189	24	251	43	161	12	216	17	15	251	...	211	5	74 *e*
	UPPER BURMA.																	
Northern.	Mandalay ...	Mandalay	1	5	10	1	16	5	13	...	18	15	15	16	...	18	...	10
	Shwebo *b* ...	Bhamo, Katha, Shwebo, and Ruby Mines.	...	...	6	...	6	6	12	2	20	11	11	6	...	20	...	5
Central.	Sagaing ...	Ye-u, Sagaing, Lower Chindwin, and Upper Chindwin.	1	12	2	9	23	11	3	11	25	21	18	23	...	25	...	15
Southern.	Minbu ...	Pakôkku, Minbu, and Magwe...	1	14	27	1	42	10	28	2	40	39	30	42	...	40	...	10
	Thayetmyo *c* ...	Thayetmyo	*d* 2	2	14	2	18	2	9	2	13	12	8	18	...	13	...	6 *e*
Eastern.	Kyauksè ...	Kyauksè	1	1	..	17	18	1	...	20	21	16	16	18	...	20	1	28
	Meiktila *f* ...	Meiktila and Myingyan ...	1	...	8	7	15	...	1	18	19	15	12	15	...	19	...	
	Vamèthin ...	Vamèthin	1	...	2	12	14	...	5	18	23	15	13	14	...	23	...	
4	8	17	1—2	34	69	49	152	35	71	73	179	18	15	152	..	178	1	74 *e*
8	20	35	1—2	72	258	73	403	78	232	85	395	17	15	403	...	389	6	148

Note.—In some cases the figures in this statement differ slightly from the corresponding ones which appear in the tables. The annual reports for the Tavoy and Shwebo schools were not received; in these cases the figures of the above statement have

VII-A.

Survey Schools for the official year 1893-94.

Number of Scholarship-holders, from time to time, during year.		Number of Scholarships allowed under new Rules.		Amount sanctioned for money-prizes per annum.	Number of students appointed to the public service during the year.	Income.				Expenditure.							Actual cost.		Remarks.
At Rs. 10.	At Rs. 5.	First grade at Rs. 10 per mensem.	Second grade at Rs. 5 per mensem.			Fees.	Fines.	Other.	Total.	Establishment.	Contingencies.	Scholarships.	Prizes.	Bonus.	Other.	Total.	Total.	Per pupil (column 13).	
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Rs.						Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
6	...	2	4		1	202	...	...	202	1,104	340	232	...	160	...	1,836	1,634	102	
5	...	4	6		...	94	..	...	94	1,104	...	195	..	...	...	1,299	1,205	121	
9	...	2	6		...	360	...	...	360	744	...	345	...	180	...	1,269	909	61	
11	...	4	8		...	316	...	...	316	1,104	...	312	...	180	..	1,596	1,280	98	
7	...	2	4		8	360	...	...	360	1,097	9	340	...	180	42	1,668	1,308	65	
16	...	2	4		7	296	...	...	296	1,104	18	239	...	260	...	1,621	1,325	88	
15	...	4	6	240	15	662	...	23	685	1,550	65	840	...	310	...	2,765	2,080	74	
17	...	4	10		...	386	...	...	386	808	300	944	...	210	...	2,262	1,876	94	
14	...	2	6		10	433	..	...	433	1,104	79	429	...	250	...	1,862	1,429	84	
5	...	2	8		...	133	...	...	133	1,104	...	237	...	110	...	1,451	1,318	120	
...	...	4	4		...	69	...	...	69	238	...	...	...	...	...	238	169	15	*a* Opened November 1893.
11	...	4	6		...	375	..	...	375	1,140	12	630	...	200	...	1,982	1,607	60	
103	...	36	72	240	41	3,686	...	23	3,709	12,201	823	4,743	...	2,040	42	19,849	16,140	80	Total for Lower Burma.
17	...	2	6		10	188	...	...	188	1,536	23	...	...	240	...	1,799	1,611	107	
...	...	4	10		...	82	...	...	82	504	175	130	...	...	...	809	727	66	*b* Opened September 1893.
21	...	6	16		15	142	...	...	142	1,012	91	1,278	...	200	...	2,581	2,439	116	
29	...	8	16	240	9	453	25	...	478	1,000	11	1,517	...	300	...	2,828	2,350	60	*c* Opened April 1891. *d* Rate in force in Lower Burma before transfer of district to the Southern Division. *e* Four belong to Lower Burma section.
...	...				2	254	3	...	257	705	541	111	...	60	...	1,417	1,160	97	
25	...	6	12		15	17	...	..	17	1,104	108	1,095	...	160	...	2,467	2,450	153	
2	...	4	8		3	65	10	...	75	677	686	100	...	10	...	1,473	1,398	93	*f* Opened June 1893.
13	...	2	4		4	30	5	...	44	1,152	...	405	...	70	...	1,717	1,673	112	
107	...	32	72	240	58	1,240	43	...	1,283	7,690	1,635	4,720	...	1,040	...	15,091	13,808	96	Total for Upper Burma.
210	...	68	144	480	99	4,926	43	23	4,992	19,891	2,458	9,429	...	3,080	42	34,940	29,948	86	Grand Total Burma.

accompanying the Report on Public Instruction; for these cases revised figures have been adopted in the present instance.
been compiled from the monthly returns of these schools.

STATEMENT VII-B.

Results of Survey Examinations from October 1892 to April 1894 inclusive.

Division.	School.	District.	OCTOBER 1892.				APRIL 1893.				OCTOBER 1893.				APRIL 1894.				Remarks.
			NUMBER OF CANDIDATES																
			From Government Survey Schools.		From other schools or private students.		From Government Survey Schools.		From other schools or private students.		From Government Survey Schools.		From other schools or private students.		From Government Survey Schools.		From other schools or private students.		
			Sent up.	Passed.	Sent up.	Passed.	Sent up.	Passed.	Sent up.	Passed.	Sent up.	Passed.	Sent up.	Passed.	Sent up.	Passed.	Sent up.	Passed.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	LOWER BURMA.																		
Arakan	Akyab	Akyab ...	...	9	...	...	14	10	...	...	9	6	...	...	...	1	...	...	
		Arakan Hill Tracts.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Kyaukpyu	Kyaukpyu ...	...	6	...	...	...	...	...	...	...	...	...	...	...	1	...	...	
		Sandoway ...	...	...	...	...	...	...	...	...	5	3	...	1	...	...	...	...	
Pegu	Rangoon...	Hanthawaddy (Rangoon).	...	8	...	3*	12	9	...	2†	18	9	...	5‡	18	...	...	...	* Three from Rangoon. † One from Rangoon. ‡ Four from Rangoon.
	Pegu ...	Pegu ...	...	5	...	1	16	12	...	6	17	7	...	4	5	2	...	1	
	Tharrawaddy.	Tharrawaddy ...	...	11	...	1	(51)	9	...	2	(51)	9	...	3	...	1	...	1	
	Prome ...	Prome ...	...	8	...	3	18	15	...	7	25	12	...	1	...	4	...	..	
Irrawaddy.	Ma-ubin ...	Thôngwa ...	...	19	...	1	(42)	21	...	1	(42)	11	...	1	...	8	...	4	
	Bassein	Bassein ...	31	15	...	4	18	15	...	3	11	6	...	1	...	9	...	...	
		Myaungmya ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Henzada...	Henzada ...	...	16	...	2	17	13	...	2	15	12	...	2	...	2	...	2	
Tenasserim.	Moulmein	Amherst (Moulmein).	...	6	...	1	18	7	...	1	8	4	...	1	...	1	...	...	
		Salween ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Tavoy	Tavoy ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Opened Nov. 1893.
		Mergui ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Toungoo	Toungoo ...	...	...	...	...	6	6	...	...	22	14	...	...	11	4	...	...	
		Shwegyin ...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	
4	12	18	...	103	...	17	...	117	...	26	...	93	...	19	...	33	...	8	Total for Lower Burma.
	UPPER BURMA.																		
Northern.	Mandalay	Mandalay ...	...	...	...	...	(25)	22	...	20	(25)	3	...	1	...	8	...	4	
	Shwebo...	Bhamo ...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	Opened Sept. 1893.
		Katha ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Shwebo ...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	
		Ruby Mines ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Central ...	Sagaing	Ye-u ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Sagaing ...	...	...	...	...	18	14	...	4	8	6	...	1	...	8	...	...	
		Lower Chindwin ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Upper Chindwin ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Southern.	Minbu ...	Pakôkku ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
		Minbu ...	13	12	...	...	17	15	...	1	22	15	...	...	...	15	...	...	
		Magwe ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Thayetmyo	Thayetmyo ...	...	...	...	1	...	...	...	...	10	6	...	4	...	1	...	...	Opened Apl. 1893.
Eastern.	Kyaukse ...	Kyaukse ...	...	...	...	...	16	16	...	12	8	2	...	...	...	6	...	1	
	Meiktila	Meiktila ...	...	...	...	...	...	...	...	1	(8)	1	...	...	(8)	4	...	...	Opened June 1893.
		Myingyan ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Yamethin	Yamethin ...	...	...	...	...	...	6	...	...	...	1	...	...	...	1	...	...	
4	8	17	...	12	...	1	...	73	...	38	..	34	...	6	...	44	...	5	Total for Upper Burma.
8	20	35	...	115	...	18	...	190	...	64	...	127	...	25	...	77	...	13	Grand total for Burma.

Note.—The figures relating to the number of examinees sent up are not available in most cases. The figures enclosed within brackets refer to the total number for the combined examinations of April and October 1893. Special examinations were held for Upper Burma in October 1892 and February 1893. The Educational Syndicate undertook the examinations for Upper Burma from April 1893.

G. B. C. P. O.—No. 6467, D. L. R. & A., 23-11-94—320.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1894-95.

RANGOON: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, BURMA. NOVEMBER 1895.

[Price,—Re. 0-10-0.]

TABLE OF CONTENTS.

REPORT ON THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BURMA FOR THE YEAR 1894-95.

	Para.	Page.
SECTION I.		
Incorporation of Section I in the Revenue Administration Report	1	1
SECTION II.		
ANALYSES OF DISTRICTS WITH REFERENCE TO SECURITY AGAINST FAMINE.		
Revised analyses of districts	2	1
LOWER BURMA.		
Pegu Division.		
Tharrawaddy district	3	1
Prome district	4	ib.
Southern Division.		
Thayetmyo district	5	2
UPPER BURMA.		
Northern Division.		
Mandalay district	6	2
Katha district	7	ib.
Ruby Mines district	8	ib.
Shwebo district	9	ib.
Central Division.		
Ye-u district	10	2
Sagaing district	11	ib.
Lower Chindwin district	12	3
Upper Chindwin district	13	ib.
Southern Division.		
Pakôkku district	14	3
Minbu district	15	ib.
Magwe district	16	ib.
Eastern Division.		
Kyauksè district	17	3
Meiktila district	18	ib.
Yamèthin district	19	4
Myingyan district	20	ib.
Rainfall and harvest and prices	21	ib.
The food-supply of Upper Burma	22	ib.
SECTION III.		
COLLECTION OF REVENUE IN PRECARIOUS TRACTS.		
System of collecting revenue in precarious tracts	23	6
SECTION IV.		
FODDER RESERVES AND ARBORICULTURE.		
Grazing-grounds in Lower Burma	24	6
Areas of fuel reserves	25	ib.
SECTION V.		
AGRICULTURAL EXPERIMENTS.		
Provision in budget for experimental cultivation	26	6
Experimental cultivation in the Southern Shan States	27	7
Old orchard stocked with fruit trees	28	ib.
Vegetable garden very successful	29	ib.
No further experiments with wheat and potatoes	30	ib.
Excellent crop of potatoes obtained	31	ib.
Financial results of experiments	32	ib.
Upper and Lower Burma	33	8
American maize	34	ib.
American tobacco	35	9
English vegetable seeds	36	ib.
Agricultural Shows.		
Agricultural shows during year	37	9
Budget provision for agricultural shows	38	ib.
Site and date of each show held	39	ib.
Result of shows	40	11
Show at Akyab a complete failure	41	ib.

	Para.	Page.
Show at Thônzè very successful ...	42	11
Remarks on the show at Henzada ...	43	ib.
The Tenasserim Agri-Horticultural Society, Moulmein ...	44	ib.
Remarks on the show at Myinmu ...	45	ib.
The Kyaungdawya show ...	46	ib.
Pyawbwè show was not successful ...	47	ib.
List of prizes awarded ...	48	ib.
SECTION VI.		
CATTLE-BREEDING AND VETERINARY ESTABLISHMENTS.		
Matters fully dealt with in Report of Civil Veterinary Department ...	49	11
SECTION VII.		
AGRICULTURAL AND FISCAL STATISTICS.		
Rainfall statistics ...	50	12
Crop Reports ...	51	ib.
Monthly food-supply notes ...	52	ib.
Fortnightly statements of retail prices ...	53	ib.
Normal prices of food-grains ...	54	ib.
SECTION VIII.		
TRADE AND TRADE STATISTICS.		
Annual Report on external trade of Burma ...	55	12
Internal trade registration ...	56	ib.
External trade registration ...	57	ib.
System of registration ...	58	ib.
Cost of registration ...	59	13
Rice-crop estimates ...	60	ib.
Director ...	61	ib.

APPENDICES.

	Page.
Appendix A.—Report on experimental cultivation in the Southern Shan States for the year 1894-95 ...	iii.
Appendix B.—Extracts from the Reports on the Agricultural shows held during the year 1894-95 ...	xi.
Statement III.—Distribution list of seed obtained for experimental cultivation during 1894-95 ...	xix
Statement IV.—Statement showing description and quantity of seeds received, together with the cost of consignment and of distribution during 1894-95 ...	xx
Statement V.—Experimental cultivation—American maize ...	ib.
Statement VI.—Experimental cultivation—Tobacco ...	ib.
Statement VII.—Experimental cultivation—English vegetable seeds ...	xxiii.
Statement VIII.—Agricultural shows. Price list ...	xxiv.
Statement IX.—Annual Famine Statement C for Burma for the year 1898-96 ...	xxvi.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1894-95.

SECTION I.

THE whole of this section has now been incorporated in the Revenue Administration Report including the paragraphs relating to Survey schools which last year appeared in this report.

SECTION II.

ANALYSIS OF DISTRICTS WITH REFERENCE TO SECURITY AGAINST FAMINE.

2. As noted in paragraph 15 of last year's report, during the year revised analyses were called for from all districts except those noted in the margin, which have been declared to be secure against famine. Up to the date of writing this report analyses have been received and accepted as correct from 18 out of the remaining 20 districts.

Akyab.	Henzada.
Northern Arakan.	Myaungmya.
Kyaukpyu.	Amherst.
Rangoon Town.	Tavoy.
Hanthawaddy.	Mergui.
Pegu.	Toungoo.
Thôngwa.	Shwegyin.
Bassein.	Salween.

These analyses, which have been carefully prepared and have been subjected to careful scrutiny in this office, may be taken as containing the best available and fairly accurate statistics regarding the present agricultural condition of the districts with which they deal. The analyses have been printed and are accompanied by maps on the scale of 4 miles to the inch.

LOWER BURMA.

Pegu Division.

Tharrawaddy district.

3. The greater part of the Tharrawaddy district is classed as secure, but 243 villages in the Tapun township with an area of 282 square miles and a population of 49,305 are shown in Group **B**, *i.e.*, as secure in ordinary years. These villages are situated in the north of the district adjoining the Prome boundary; the rainfall in them is often scanty, but it is unlikely that serious scarcity would occur except in years of quite exceptional drought. In ordinary years good crops are produced and paddy is largely exported.

Prome district.

4. In the Prome district 785 villages with an area of 665 square miles and a population of 236,069 are classed as perfectly secure. This tract exports largely every year. Fourhundred and six villages with an area of 600 square miles and a population of 76,762 are said to be secure in ordinary years. These villages are situated in the Padaung, Shwedaung, Thegôn, Paungdè, Shwele, and Mahathaman townships; the crop is as a rule secure, but the rainfall in them is somewhat scanty and capricious and as a consequence failure of crops sometimes results. The **C** or insecure villages number 318 with an area of 1,482 square miles and a population of 41,885; they are situated in the hilly and sparsely populated parts of the district.

Southern Division.

Thayetmyo district.

5. Only 60 villages out of a total of 792 in the Thayetmyo district are classed as perfectly secure. These are irrigated from streams which have never been known to fail or consist of lowlying lands along the Irrawaddy. Two hundred and eighty-five villages with an area of 1,991 square miles and a population of 66,577 have been placed in the **B** Group, and 447 villages with an area of 2,490 square miles and a population of 98,029 are classed as insecure. Many of the **B** Group villages are partly protected by irrigation works, but these depend on local rainfall, which is very capricious. The **C** group villages contain paddy-lands which are entirely dependent on the rainfall, which in this district is scanty and irregular; they also cultivate ya crops extensively, the principal of which are sessamum and maize. The sessamum crop, though valuable, is extremely precarious.

UPPER BURMA.

Northern Division.

Mandalay district.

6. In Mandalay 157 villages with an area of 357 square miles and a population of 114,809 are classed as perfectly secure against famine in all years. These villages are situated in the well-irrigated tracts in the Kutywa-Taungbyôn, Madaya, and Ngasingu townships; 97½ villages with an area of 886 square miles and a population of 30,643 are classed as secure in ordinary years, while 110½ villages with an area of 944 square miles and a population of 45,793 are classed as insecure.

In favourable years many of the villages in Group **B**, *i.e.*, secure in ordinary years, are well irrigated and produce a large surplus of grain. Restoration of the old Burmese irrigation channels and weirs would bring many of the villages which are now classed as insecure (Group **C**) into Group **B**.

Katha district.

7. In the Katha district 390 villages with an area of 1,310 square miles and a population of 36,665 have been classed as secure. These villages are all irrigated from the Daungyu canal or other perennial streams. The rest of the district has been classed as secure in ordinary years. Katha is outside of the dry zone and the rainfall is fairly abundant and regular.

Ruby Mines district.

8. In the Ruby Mines district 236 villages with an area of 2,612 square miles and a population of 37,146 have been classed as perfectly secure against famine. The remaining villages in the district, 177 in number with an area of 2,124 square miles and a population of 27,487, are said to be secure in ordinary years. The Mogôk township is classed as secure always and the Tagaung township as secure in ordinary years only, while the rest of the townships fall partly into both classes.

Shwebo district.

9. No villages in the Shwebo district are classed as secure; 133, which are irrigated from the Mu canal or from tanks, are shown as secure in ordinary years. These irrigation works are very much out of order, otherwise the villages classed as **B** would be in the **A** tract. The rest of the district consisting of 391 villages with a population of 96,264 depends entirely on rainfall, which is usually deficient, and has consequently been shown in the **C** Class as insecure.

Central Division.

Ye-u district.

10. In the Ye-u district no areas have been classed as secure; 147 villages in the northern portion of the district have been classed as secure in ordinary years and 507 villages in the southern portion as insecure.

Practically the whole district is dependent on the rainfall, which is irregular and often scanty.

Sagaing district.

11. In the Sagaing district 270 villages with a population of 128,629 and a gross area of 400 square miles have been classed as secure. These are villages which are irrigated from the Irrawaddy and Chindwin rivers; many of them too receive the overflow from

the Irrawaddy. These villages are very fertile; they produce three crops a year, two of which are practically certain. Two hundred and thirty-nine villages have been shown in the **B** group; these are villages which are partially irrigated from rivers, tanks, or lakes; but the quality of the irrigation depends largely on the rainfall, while they also contain land which is entirely dependent on rainfall. The **C** group of villages, of which there are 165 with a population of 55,015, consist of high-lying lands with generally poor soil and entirely dependent on rainfall, which is scanty and erratic.

Lower Chindwin district.

12. In the Lower Chindwin district only 10 villages have been classed as secure; these are villages which are irrigated from the Yoma river; 130 villages have been placed in the **B** Class and 110 in the **C** Class. The villages in both these classes are dependent on rainfall for their crops, but the difference between them is that in the **B** villages the rainfall is usually sufficient and the village lands are low-lying, while in the **C** villages the rainfall is erratic and scanty and the cultivated lands are high-lying.

Upper Chindwin district.

13. Three hundred and forty-six villages in the Upper Chindwin district have been classed as secure; most of these villages are irrigated from perennial hill streams or from rivers. Six hundred and sixty-nine are classed as secure in ordinary years; most of these are dependent on rainfall which, however, as a rule, is sufficient and timely, the Upper Chindwin being outside of the dry zone. There are only 41 villages classed as insecure and the people in them are not entirely dependent on cultivation for their subsistence.

Southern Division.

Pakôkku district.

14. In the Pakôkku district 381 villages with a population of 113,505 and a gross area of 1,700 square miles have been classed as secure; 526 villages with a population of 104,900 and a gross area of 2,420 square miles as secure in ordinary years, and the remainder of the district containing 448 villages with a population of 72,504 and a gross area of 2,180 square miles as insecure.

The secure tracts consist of islands in the Irrawaddy and villages in which the rainfall is practically certain and which are irrigated from perennial streams, the principal of which are the Yaw, the Man, and the Myittha. The tracts secure in ordinary years also contain irrigated areas, but the water-supply for irrigation is liable to failure when rainfall is scanty. The insecure tracts consist of high-lying villages with a capricious and scanty rainfall.

Minbu district.

15. In Minbu 165 villages with a population of 68,708 are classed as secure; 168 villages with a population of 45,481 as secure in ordinary years, and 28 villages with a population of 5,459 as insecure. The secure tracts are those irrigated from those parts of the Môn or Man irrigation systems which are in good order. The **B** tracts consist partly of irrigated and partly of island lands dependent on the rise of the river.

The **C** tracts are those which are entirely dependent on rainfall. The contemplated improvement of the Môn irrigation system will, when effected, cause many of the villages now classed as **B** to be transferred to the **A** Class.

Magwe district.

16. Nearly the whole of the Magwe district is entirely dependent on the rainfall, which is scanty and capricious, and accordingly 722 villages out of a total of 753 have been classed as insecure. The remaining 31 villages consist of lands irrigated by the rise of the Irrawaddy, or from streams, and have been classed as secure in ordinary years.

Eastern Division.

Kyauksè district.

17. In the Kyauksè district 371 villages out of a total of 422 are classed as perfectly secure: 26 are placed in the **B** class and 25 in the **C** class.

Meiktila district.

18. None of the villages in the Meiktila district are classed as perfectly secure and only 96 out of a total of 1,061 as secure in ordinary years, the rest being shown as insecure.

When a good season occurs villages in both classes produce a large surplus. A large portion of the cultivated area in this district consists of high-lying lands producing cotton, sessamum, and jowar. These are entirely dependent on local rainfall, which is very variable, and the crops are consequently very precarious.

Yamèthin district.

19. In Yamèthin 82 villages have been shown as perfectly secure, while nearly the whole of the rest of the district has been shown as secure in ordinary years, only seven villages being shown as insecure.

Irrigation works in this district have been improved, but it is probable that a considerably larger portion of the district should have been shown as insecure as it does not differ materially in character from those parts of the Meiktila district which have been shown as insecure.

Myingyan district.

20. There are no villages in the Myingyan district which are classed as secure. One hundred and eighty-three villages with a population of 86,988 and a gross area of 934 square miles are classed as secure in ordinary years. These villages contain the island and riverine tracts and also a small area watered by the Pin chaung.

The rest of the district containing 688 villages with a population of 227,264 and a gross area of 2,803 square miles has been classed as insecure: the whole of this tract is dependent on rainfall. Myingyan is one of the worst districts in the dry zone, the rainfall being very scanty and uncertain.

21. (1) *Rainfall and Harvest.* | (2) *Prices.*

These subjects are fully dealt with in the Revenue Administration Report.

The food-supply of Upper Burma.

22. The statement given below shows the quantity of the various food grains and other provisions which were exported and imported by Upper Burma during the year.

Statement showing the direction of trade in the principal food-grains, pulse, and provisions.

Year.	Description.	Brought into Upper Burma. From Lower Burma.	Brought into Upper Burma. From foreign countries.	Brought into Upper Burma. Total.	Taken out of Upper Burma. To Lower Burma.	Taken out of Upper Burma. To foreign countries.	Taken out of Upper Burma. Total.	Balance. Brought into Upper Burma.	Balance. Taken out of Upper Burma.	Net total of food-grains, &c., brought into Upper Burma.	Remarks.
		Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	
1893-94	Wheat	13,178	...	13,178	54,584	4,477	59,061	...	45,883	...	
	Paddy	11,42,343	135	11,42,478	10,825	...	10,825	11,31,653	...	...	
	Rice	15,63,011	39,995	16,03,006	5,258	3,111	8,369	15,94,637	...	...	
	Jowar and bajra ...	...	...	...	...	...	...	...	...	...	
	Gram and pulse ...	21,485	382	21,867	6,06,787	697	6,07,484	...	5,85,617	...	
	Other grains and pulse	10,967	...	10,967	10,115	...	10,115	852	...	...	Maize, barley, and oats.
	Ghee	16,004	60	16,064	162	215	377	15,687	...	...	
	Dried fruits and nuts...	83,097	15,688	98,785	2,21,794	686	2,22,480	...	1,23,695	...	Onions, garlic, potatoes, dates, tamarind, &c.
	Other provisions ...	7,68,525	1,04,675	8,73,200	47,147	45,174	92,321	7,80,879	...	...	Ngapi, salted or dried fish, flour, biscuits, butter, condensed milk, pickled tea, &c.
	Total ...	36,18,610	1,60,935	37,79,545	9,56,672	54,360	10,11,032	35,23,708	7,55,195	27,68,513	
1894-95.	Wheat	72,249	224	72,473	8,594	1,383	9,977	62,496	...	...	
	Paddy	5,07,773	3,278	5,11,051	4,45,020	2,068	4,47,088	63,963	...	...	
	Rice	4,91,476	20,451	5,11,927	23,790	986	24,776	4,87,151	...	...	
	Jowar and bajra ...	...	...	...	222	...	222	...	222	...	
	Gram and pulse ...	24,371	478	24,849	6,64,161	1,475	6,65,636	...	6,40,787	...	
	Other grains and pulse	16,051	130	16,181	3,426	...	3,426	12,755	...	...	Maize, barley, and oats.
	Ghee	15,672	20	15,692	122	597	719	14,973	...	...	
	Dried fruits and nuts...	69,412	35,520	1,04,932	2,11,124	1,800	2,12,924	...	1,07,992	...	Onions, garlic, potatoes, dates, tamarind, &c.
	Other provisions ...	7,26,293	1,11,855	8,38,148	39,091	73,597	1,12,688	7,25,460	...	...	Ngapi, salted or dried fish, flour, biscuits, butter, condensed milk, pickled tea, &c.
	Total ...	19,23,297	1,71,956	20,95,253	13,95,550	81,906	14,77,456	13,66,798	7,49,001	6,17,797	
	Increase or decrease ...	− 16,95,313	+ 11,021	−16,84,292	+ 4,38,878	+ 27,546	+ 4,66,424	− 21,56,910	− 6,194	− 21,50,716	

The figures given in the corresponding statement in last year's report for 1893-94 have been revised, as it has been found that through a mistake the figures for exports to foreign countries had been wrongly shown as imports to foreign countries and *vice versâ*.

Comparing the figures as now given it will be seen that exports from Upper Burma increased very largely while imports into Upper Burma show a corresponding decrease, the net balance against Upper Burma amounting to 617,797 maunds against 2,768,513 maunds last year. This is a very satisfactory improvement, which is due to the good harvests which were obtained in the year over nearly the whole of Upper Burma. It will be noticed that Upper Burma imported wheat during the year, while last year there was a balance in favour of Upper Burma. This is due to the failure of the wheat crop during the year owing principally to the crop being attacked by rust.

Upper Burma exported nearly as much paddy as it received, but it imported rice largely, chiefly milled rice from Rangoon. The export of gram and pulse (gram forms but a small part of this) was very large.

The balance in favour of imports is entirely due to the large figures shown under the head "Other provisions," which consist chiefly of ngapi and salted and dried fish. As far as actual food-grains are concerned Upper Burma exported more than she received.

SECTION III.

Collection of Revenue in Precarious Tracts.

23. No alteration has been made during the year in the system of collecting revenue in precarious tracts, and probably no alteration is necessary. The rules under the Lower Burma Land and Revenue Act and the Upper Burma Land and Revenue Regulation provide sufficiently for remission of revenue being obtained in case of failure of crops. At present in Upper Burma no rate is levied on land left fallow.

Kyauksè is the only district where the revenue of the whole district is collected on accurately ascertained areas. It has lately been decided that revenue is not to be assessed on lands on which the crop has totally failed. Hitherto the procedure has been to assess the revenue and leave the cultivator to apply for remission. In the other districts of Upper Burma, State land revenue is assessed and collected by the thugyis and they, as a matter of fact, only assess lands which have actually borne a crop.

At the Mandalay Settlement Conference, which was held during the year, various methods of assessment in the precarious tracts of the dry zone were discussed, but no final decision was arrived at.

SECTION IV.

Fodder Reserves and Arboriculture.

24. The subject of grazing-grounds in Lower Burma is fully dealt with in paragraphs 99—103 of the Revenue Administration Report. In Upper Burma no grazing-grounds were reserved during the year.

25. It is proposed to set aside areas for fuel reserves in the Thôngwa district. Enquiries as to suitable areas have been made during the year and formal proposals will shortly be made. Mr. Hildebrand in his report again emphasizes the need for tree planting in the Southern Shan States, and he has lately asked that any balance from the allotment for experimental cultivation in the Southern Shan States may be allowed to be spent on planting shade trees in and about the station of Taunggyi.

SECTION V.

Agricultural Experiments.

26. A sum of Rs. 10,460 was provided in the budget of 1894-95 for experimental cultivation at the Lashio Farm, Northern Shan States, as was stated in last

year's report. The farm was closed at the end of 1893-94. Rupees 7,500 were transferred from the allotment to the Veterinary Department budget to meet the increased expenditure under "Veterinary" and "Stallion" charges in Upper Burma, the balance of the allotment being allowed to lapse.

Experimental cultivation in the Southern Shan States.

27. Mr. Hildebrand, the Superintendent of the Southern Shan States, continued his agri-arboricultural experiments at Taunggyi during the year. A European gardener was engaged for the special work of budding, grafting, and pruning the fruit trees.

28. The old orchard, which measures 20½ acres, is now fully stocked with fruit trees, including apple, pear, plum, cherry, and peach trees. The work of budding, grafting, and pruning has been successfully carried out and all the trees are reported to be doing well. In the orchard Jerusalem artichokes and rhubarb were grown in available spaces. The first-named gave an abundant crop of first-rate tubers, but the rhubarb, although it promised well at first, afterwards rotted owing to excessive rain.

29. The vegetable garden, which covers 1½ acres, has been very successful, and the money realized by the sale of its produce nearly equalled the expense of upkeep. The vegetables grown were of the English varieties and the crop obtained was disposed of locally to the European residents. An additional area of 20 acres was taken up during the year and planted with potatoes and wheat. Excellent crops of both were obtained both as regards quantity and quality, but the money realized by the sale of produce did not equal the cost of the experiment; this is due to there being but little local demand and to the cost of carriage to the railway being prohibitive. It has now been clearly demonstrated that both potatoes and wheat can be grown successfully in the Southern Shan States, but as before noted cultivation on a large scale can only be carried on at a profit provided the produce can be disposed of locally. It is satisfactory to be able to add that since the close of the year it has been decided, with the sanction of the Government of India, that preference is to be given by the Commissariat Department at Fort Stedman to local contractors who are willing to supply wheat, provided that they tender at a price which is not higher than that at which wheat can be imported from other markets. The price to be paid for the wheat is to be arranged by a Committee, of which Mr. Hildebrand is to be one of the members. During the current year 1895-96 seed advances to the amount of Rs. 3,000 have been made to the Shan cultivators, and it is anticipated that they will be able to supply 500,000 lbs. of wheat to the Commissariat Department. If the present year's crop succeeds, it is probable that no further advances will be required and that the whole of the wheat required for the troops at Fort Stedman will be supplied locally in future years. The price, too, at which the wheat can be supplied in the future will probably be considerably lower than that hitherto paid to contractors who have to import from Rangoon.

30. No further experiments with wheat and potatoes will be made by Mr. Hildebrand as it is considered that the cultivation of these products has now passed beyond the experimental stage.

31. An excellent crop of potatoes (kidney) was obtained by cultivators in the Myelat, to whom seed had been supplied by Government, but the local market was so overstocked that prices fell very low and sales were effected at a loss to the growers.

32. The financial results of Mr. Hildebrand's experiments are given below. The nett cost was Rs. 4,329-12-0, or an increase over last year of Rs. 1,556, which is chiefly due to the entertainment of the head gardener and the cost of building a house for him :—

Disbursements.

	Rs.	A.	P.	
On orchard	4,085	11	4	
On garden	190	0	0	
On potatoes	660	8	0	
On wheat	351	0	0	
				5,287 3 4

Receipts.

	Rs.	A.	P.			
By sale of vegetables	187	15	0			
By sale of potatoes	504	5	2			
By sale of wheat	265	3	2			
				957	7	4
Nett expenditure				4,329	12	0

Mr. Hildebrand's report is attached *in extenso* as an appendix A to this report.

Upper and Lower Burma.

33. No experimental cultivation of wheat or gram was carried on during the year in Upper or Lower Burma as no indents for seeds of these two crops were received from local officers; the experiments were confined to American maize, tobacco, and English vegetables.

American maize.

34. American maize of the Golden Dent Corn, White Gourd Corn, and White Flint Corn varieties was obtained direct from Messrs. Landreth and Sons, Philadelphia, and 945 cobs in all were distributed to District Officers and others in Upper and Lower Burma for experimental purposes. The results of the experiments are given in statement V of the appendix. Reports on the cultivation have been received from 20 centres. From six centres complete success is reported, from six others partial success, while the experiment failed entirely in the remaining eight centres. Below the results of the experiments are briefly noted district by district.

Sandoway.—Complete failure; no reason given.

Hanthawaddy.—Plants germinated, but did not mature properly.

Bassein.—Failure. The seed produced was small and scanty and inferior to the country variety.

Amherst.—Partially successful; the heavy rainfall was prejudicial to the crop.

Tavoy.—Failure owing to heavy rainfall.

Mergui.—The experiment failed owing to unsuitable soil being selected.

Salween.—The experiment was not successful owing to late sowing.

Toungoo.—The experiment conducted by Mr. Petley was completely successful, very fine cobs being obtained. In the rest of the district only a partial success was obtained owing, it is said, to deficient rainfall.

Shwegyin.—Failed partially owing to heavy rain.

Thayetmyo.—Successful in Taingda and Thayetmyo townships, but only partially so in the Minhla township owing to heavy rain and the ravages caused by ants.

Pakôkku.—The experiment succeeded as far as regards the growth, but the outturn was small. In this district maize is chiefly grown to provide leaves for wrapping cigars. The leaves of the American maize are said to be coarser than those of the country maize and therefore unsuitable for cigar wrappers. Specimens of the leaves of the two varieties were sent for inspection, but I was unable to see much difference between them.

Magwe.—Succeeded in Taungdwingyi, but failed in Yenangyaung owing to late sowing.

Mandalay.—Succeeded in Maymyo subdivision, but failed in Singu township owing to floods.

Katha.—The experiment was very successful, the crop obtained being much heavier than that from the country variety.

Ruby Mines.—The seed germinated well, but the outturn was poor.

Shwebo.—Failed owing to want of rain and the unexpectedly high rise of the Mu river.

Sagaing.—Failed in two subdivisions owing to want of rain and floods, but was very successful in Myinmu, where the plant grew to a height of 8 feet 8 inches and the cobs were 15 inches long.

Lower Chindwin.—A very good crop was obtained.

Upper Chindwin.—Heavy rain caused the crop to fail.

Myingyan.—The experiment failed in all cases. No reason is assigned.

The imported variety ripens earlier than the native variety, and the grain, though larger, is coarser and said not to be as palatable as the country corn.

In several instances where the cultivation has succeeded a quantity of the cobs produced are being kept for seed. The acclimatized seed should be more hardy than that freshly imported, and it is hoped that better results will be obtained from it. Experiments with American maize have now been carried on for a considerable number of years, and seed has again been distributed this year, but I think it will be advisable to discontinue the experiment, as on the whole but little success appears to have been obtained in inducing cultivators to grow American in preference to the variety to which they are accustomed.

American tobacco.

35. Seed was distributed to 13 districts. In many cases the seed is said to have been received too late: care has been taken this year to guard against this, the seeds being distributed two months earlier than they were last year. From seven centres total failures are reported, in two partial success was obtained, and in one only (Pakôk-ku) was the result encouraging. At three centres no experiments were made—in two owing to the alleged late receipt of the seed, and in one owing to an oversight on the part of the Deputy Commissioner. A sample of tobacco grown in Pakôk-ku was sent to the Secretary, Agri-Horticultural Society, for opinion on its quality and value, who reported that it was of poor quality and small value owing to the very small size of the leaves. The results of the experiments are tabulated in Statement VI of the Appendix.

English vegetable seeds.

36. English vegetable seeds were obtained through the Secretary, Agri-Horticultural Society, Rangoon, from Messrs. Sutton and Sons of Reading. The seeds were distributed only in Upper Burma and the Chin Hills. The experiments were successful at seven centres, partially successful at two, while in the rest they failed. The experiments were particularly successful in the Chin Hills. The climate of Haka seems to be very favourable to the growth of English vegetables. In addition to the above experiments 5 maunds of arhar and bajra seed, 20 Jamun plants, and 8 seers of Jamun seed were procured from Cawnpore through the Director of Agriculture, North-Western Provinces, for experimental cultivation in Meiktila by Mr. Bligh, Executive Engineer, Public Works Department, but no report has been received of the result of the experiment. One hundred and twenty cocoa plants were obtained through the Tenasserim Agri-Horticultural Society and forwarded to Mr. J. D. Watson, Tavoy, for experimental cultivation: he too has not sent in any report. The total cost to Government of the experiments with American maize, American tobacco, English vegetable seeds, &c., amounted to Rs. 729-13-0.

Agricultural Shows.

37. In accordance with the programme given in section 74 of last year's report agricultural shows were held during the year at Akyab, Thônzè, Henzada, Moulmein, Myinmu, Kyaungdawya, and Pyawbwè. The Mandalay show was not held owing to the Deputy Commissioner being fully engaged in the work of attempting a re-adjustment of the thathameda consequent on settlement, and also to the depressed condition of the people consequent on heavy losses of cattle from disease.

38. The total budget provision for agricultural shows in both Upper and Lower Burma was Rs. 4,000, but of this only Rs. 2,765 was allotted and only Rs. 1,992-9-0 spent.

39. The following statement shows the site and date of each show held, the amount allotted, and the amount spent:—

Division.	District.	Town.	Date of show.	Areas to which exhibits were restricted.	Allotment. Prizes.	Allotment. Contingencies.	Allotment. Total.	Expenditure. Prizes.	Expenditure. Contingencies.	Expenditure. Total.	Remarks.
			1895.	LOWER BURMA.	Rs.	Rs.	Rs.	Rs.	Rs. A. P.	Rs. A. P.	
Arakan ...	Akyab ...	Akyab ...	9th March ...	Akyab and Urittaung townships of the Akyab district.	280	20	300	60	...	60 0 0	
Pegu ...	Tharrawaddy ...	Thônzè ...	do. ...	Tharrawaddy and Prome districts and the Insein subdivision of the Hanthawaddy district.	400	...*	400	365	...*	365 0 0	
Irrawaddy ...	Henzada ...	Henzada ...	19th March ...	Henzada, Ôkpo, Lemyethna, and Zalun townships of the Henzada district, the Kyônpyaw township of the Bassein district, and the Danubyu township of the Thôngwa district.	300	...	300	170	26 9 0	196 9 0	
Tenasserim ...	Amherst ...	Moulmein ...	5th February ...	Tenasserim division	335	125	460	150	40 0 0	200 0 0	
				Total for Lower Burma ...	1,315	145	1,460	755	66 9 0	821 9 0	
				UPPER BURMA.							
Northern ...	Mandalay ...	Mandalay ...	12th March ...	Mandalay and Shwebo districts ...	...	...	...	...	...	...	Show not held.
Central ...	Sagaing ...	Myinmu ...	7th April ...	Sagaing and Lower Chindwin districts	400	150†	550	358	328 0 0‡	686 0 0	
Southern ...	Minbu ...	Kyaungdawya...	9th March ...	Minbu district	360	40	400	310	...	310 0 0	
Eastern ...	Yamèthin ...	Pyawbwè ...	11th March ...	Eastern division	355	...	355	175	...	175 0 0	
				Total for Upper Burma ...	1,115	190	1,305	843	328 0 0	1,171 0 0	
8	8	8	Feby.—April.	Total for the Province ...	2,430	335	2,765	1,598	394 9 0	1,992 9 0	

* Provided from District Cess Funds. | † Besides Rs. 223-12-0 raised by subscription. | ‡ Partly met (Rs. 178) from private subscriptions.

40. The shows at Thônzè, Moulmein, Myinmu, and Kyaungdawya were successful, the others were not. Below is a brief account of each show.

41. *Akyab.*—The show at Akyab was a complete failure. The people are said to take no interest in it, and on the recommendation of the Commissioner and Deputy Commissioner it has been decided to abolish it.

42. *Tharrawaddy.*—The show held at Thônzè in March 1895 was very successful. Exhibits were numerous and of good quality and the attendance of spectators was very large. The Financial Commissioner, the Director, and the Superintendent of the Civil Veterinary Department were present and the first named gave an address in Burmese. The Deputy Commissioner, Mr. Ross, in his report suggested that in future prizes should not be offered for half-bred ponies, and it has now been decided that in future prizes are only to be offered for pure Burman or Shan ponies.

43. *Henzada.*—The show at Henzada was a failure; this is due to the fact that the district authorities took little or no interest in it. The Deputy Commissioner (Mr. Mitchell) was not even present at the show owing, he reports, to his having forgotten the date. The success or failure of these shows at all events at first depends largely in the amount of interest taken in them by the district authorities and in particular by the Deputy Commissioner; and, if the latter is not even present at the show, there can be very little hope of any success being attained. The Superintendent, Civil Veterinary Department, was present at this show.

44. *Moulmein.*—This show was held at the same time as the annual show of the Tenasserim Agri-Horticultural Society. It was not so successful as the one last year, either in the quality and quantity of the exhibits or the number of people who attended. It was, however, a success.

As an outcome of the show the Agri-Horticultural Society have suggested that Government should do something to encourage the cultivation of spices in Amherst and with this object clove and nutmeg plants have been ordered from Penang and Singapore for free distribution to cultivators in Amherst.

45. *Myinmu.*—This show was held in April 1895 and was very successful, the exhibit of plough-cattle being particularly fine. The building in which the exhibits were placed was a picturesque, commodious, and inexpensive structure. It cost Rs. 200, of which Rs. 100 was recovered from the sale of the materials. A drawing was made of it, which will be circulated as a model for other shows. The success of the show was largely due to the exertions of the Deputy Commissioner, Captain Browning. The Director and the Superintendent, Civil Veterinary Department, were present at the show. Next year the show will be held in March instead of April at the request of the thugyis and exhibitors.

46. *Kyaungdawya.*—This show was held on the 9th March 1895 close to the Kyaungdawya pagoda.

The show was successful, except as regards the exhibits of poultry and vegetables. The exhibit of bullocks was particularly good. The Deputy Commissioner, Captain Johnson, took a great interest in the show.

47. *Pyawbwè.*—This show was not successful; exhibits were few and only from the Pyawbwè township, and the number of visitors was small. This is attributed to the show being the first of its kind, but in view of the results obtained at Myinmu this is hardly a satisfactory explanation.

48. A list of the prizes awarded at the various shows is given in Statement VIII of the Appendix.

SECTION VI.

* CATTLE-BREEDING AND VETERINARY ESTABLISHMENTS.

49. The matters to which this section relates are fully dealt with in the Report of the Civil Veterinary Department, Burma, for 1894-95, and my note on the report, and in the paragraphs on "Cattle" in the Report on the Revenue Administration of Burma for 1894-95.

* See the report for 1894-95 of the Civil Veterinary Department, Burma.

SECTION VII.

AGRICULTURAL AND FISCAL STATISTICS.

Rainfall statistics.

50. The "Rainfall Report," which has been written as a separate report for the first time this year, deals fully with the question of the registration of rainfall, the inspection of rain-gauges by District Officers, and the quality of the registration work performed by the various officials in charge of rain-gauges. Monthly statements of rainfall continued to be received from all registering stations during the year. These are very often carelessly prepared, numerical inaccuracies being common, and it frequently happens that the figures shown in the monthly statements do not agree with those given in the weekly crop reports. Eighty-five references had to be made about discrepancies or inaccuracies, and 34 statements were returned for revision.

Crop reports.

51. Weekly crop reports were received from all districts in the same way as last year. During the year 23 reports were received too late for inclusion in the weekly returns, and 148 references had to be made regarding omissions and discrepancies. References were most numerous in the case of the Myingyan district.

These reports are important, as they are the only means by which the agricultural condition of districts can be gauged, and they should as a rule be prepared by Deputy Commissioners themselves after careful scrutiny of the reports of Subdivisional and Township Officers, but many of the reports received bear internal evidence of having been prepared by subordinates.

Monthly food-supply notes.

52. No change was made in the method of the preparation of the monthly notes during the year. They are published in the Supplement to the *Burma Gazette.*

Fortnightly statements of retail prices.

53. Five of the fortnightly statements of retail prices were received late and 65 references owing to omissions and discrepancies had to be made during the year.

Normal prices of food-grains.

54. The table of normal prices has not yet been revised, but it undoubtedly requires revision, particularly in the case of miscellaneous food-grains in Upper Burma. To ensure an accurate table of normal prices being prepared, it is first of all necessary that accurate prices should be reported by Deputy Commissioners. This is far from being the case at present, the figures reported from adjoining districts between which communication is easy being often quite inconsistent.

SECTION VIII.

TRADE AND TRADE STATISTICS.

55. The annual report on the external trade of Burma has already been submitted: the report on internal trade is due on September 20th.

Internal trade registration.

56. The registration of trade between Upper and Lower Burma was carried on at the same stations as in 1893-94. Besides the trade registered at these stations and the figures for the railway-borne trade furnished by the Examiner of Railway Accounts, manifests are supplied by the Irrawaddy Flotilla Company of all goods carried in their steamers between Upper and Lower Burma, and statements of Government stores, &c., carried in Government vessels are furnished by the Port Officer, Rangoon.

External trade registration.

57. The number of stations at which the registration of the trade of Burma with adjacent foreign countries was carried on was 17 —11 in Upper Burma and 6 in Lower Burma—three new stations in Upper Burma and one in Lower Burma being opened during the year.

System of registration.

58. No change was made in the system of registration during the year; it works as well as can be expected considering the low-paid agency by which it is effected. The volume of work at the headquarters office increased considerably during the year owing to the increase in the number of registering stations. One additional clerk was appoint-

ed. The office is still hard-pressed, but arrears were cleared off and the quarterly and annual reports were brought out more punctually during the year.

Cost of registration.

59. The total cost of trade registration was Rs. 16,780 made up as follows :—

	Rs.
Cost of registering internal trade	4,283
Cost of registering external trade	6,009
Cost of headquarters office	6,488
Total ...	16,780

Rice-crop estimates.

60. As usual three estimates of the rice crop of Lower Burma and of the surplus available for export were prepared. By the final one, which appeared in February 1895, the available surplus was estimated at 1,200,000 tons of cargo rice. Some of the rice firms have lately raised the estimate slightly from accounts they have received of stocks in the interior; but, as far as exports up to date show, I see no reason for altering the estimate, which for all practical purposes may be said to have been correct.

Director.

61. Mr. Mathews was in charge of the Department during the year.

T. C. WILSON,
Director of the Department of Land Records and Agriculture.

APPENDICES.

APPENDIX A.

REPORT ON EXPERIMENTAL CULTIVATION IN THE SOUTHERN SHAN STATES FOR THE YEAR 1894-95.

THIS report embraces the period from 1st June 1894 to 31st May 1895.

2. *Grant.*—The grant for the year was Rs. 5,140, being an advance of Rs. 740 upon that for the preceding year.

3. *Expenditure.*—The total expenditure for the financial year, *i.e.*, from 1st April 1894 to 31st March 1895, was Rs. 4,909-4-0 or Rs. 230-12-0 below the sanctioned grant.

For the working year under report, namely, from 1st June 1894 to 31st May 1895, the total expenditure has been Rs. 5,287-3-4 (*vide* Statement A annexed), or an increase of expenditure of Rs. 1,556-6-3 upon last year. The cause of this increase will be found in the body of the report, but roughly it may be ascribed to the entertainment of a head gardener on Rs. 125 per mensem in November of the year and building him a house which cost Rs. 1,000.

Receipts.—The total receipts for the year have been—

	Rs.	A.	P.
(1) Sale of vegetables	187	15	0
(2) Sale of potatoes	504	5	0
(3) Sale of wheat	265	3	2
Total ...	957	7	2

Deducting therefore the receipts for crops sold, the net actual expenditure for the working year remains at Rs. 4,347-11-0.

The cause of decrease in receipts was the failure to sell the large crop of potatoes locally, and the cart-hire to take them to the railway was not quite covered by the price they fetched when they arrived there.

Statement I annexed will show the headings under which this expenditure and receipts have occurred and Statement II will give the details of disbursements.

4. *Work for the year.*—The old orchard of 20½ acres has had all the gaps which have occurred by the death of trees filled in again and is now once more fully stocked.

A large number of the plantain trees have also been removed to make way for an equal number of indigenous plum trees as stock to bud on.

The new extension was surveyed by Mr. Litster, Executive Engineer, for me and proved to be 19·85 acres, roughly 20 acres.

The whole of this has been used for experiments in wheat and potatoes until there are fruit trees ready to plant out in it, and there is now a crop of potatoes in the ground. Four acres have been fully planted out with trees imported from Saharunpore, and with some apple and pear trees which Mr. W. Boxall of the firm of Messrs. Low and Co., Clapton Nursery, kindly presented to me, and with apple, pear, and plum stock for grafting. There is also a large number of apple and pear seedlings coming on to plant up the rest, which will be put in as far as they will go when the potato crop is removed.

The vegetable garden has been kept up as before.

The total area now under cultivation including the vegetable garden is 42 acres.

The growth of potatoes has now passed beyond the experimental stage, the experiment having conclusively proved that excellent crops of the very best quality of potatoes can be grown, but that the cart-hire for the 106 miles to the railway, and having no trustworthy agent there to receive and make the most of the market, forbids any profits to be made out of the crop.

To a small extent they can be sold retail for local consumption and will then pay.

Further experiments were also made in wheat as a "taungya" crop to ascertain the proper date for sowing.

As a result of the year's work, the success in cultivation is encouraging both as regards fruit trees, vegetables, wheat, and potatoes, but it has also satisfactorily demonstrated that none of these things can be grown to pay on a large scale with no local population as customers and with a lead of 106 miles of cart-road to the railway that is practically impassable for carts for about one-third of the year. To continue experiments therefore in potatoes or wheat is useless and will be discontinued. With fruit for the future I shall confine my planting to apples, pears, nuts, and oranges, which will bear carriage.

Of the softer kinds of fruit there are now ample to demonstrate whether they can be successfully grown and which varieties are the best suited to soil and climate.

The vegetable garden will be maintained as being practically self-supporting and a great boon to the European community, though it also has got beyond the experimental stage.

5. *General remarks.*—Only village labour has been used, so that whatever has been done has been as instructive to the indigenous population as myself. They are, however, slower than I had hoped in taking advantage of the education thus imparted; and the growth of European vegetables except potatoes does not seem to make much headway, though they are, when grown in a small way, a paying crop. That potatoes and wheat are not henceforth largely produced is no wonder; the growth is comparatively easy, but there is no market for the sale of the crops.

Great havoc has been made among the indigenous apple and peach stock put out in 1892-93.

The trees had made such excellent growth that they have all had to be sawn down to the ground as being too old and mature to graft or bud upon. Thus not only has a whole year's growth been wasted, but the soil has been impoverished to that extent, and the side shoot upon which the graft will now have to be made will never be as satisfactory as the parent stem. The gardener, however, for this purpose so anxiously looked for last year has at length been sanctioned and appointed during the year under report.

6. *Establishment.*—The permanent establishment has had to be increased by a head gardener for the pruning, grafting, and budding and one extra garden cooly. Mr. Colyear has been engaged as head gardener on Rs. 125 a month, to be increased to Rs. 150 after the first year.

My Shan interpreter Maung Saye is as indefatigable as ever as supervisor of the casual coolies which have to be engaged from time to time.

Maung To Mya, the Treasurer, has also been as indefatigable as ever in looking after the cultivation of wheat by the villagers.

Maung Sè, the overseer of the orchard and garden labour, has done his work in the praiseworthy manner that has characterized him since the experiment commenced in 1891 with the vegetable garden.

I have had to raise his pay slightly and also that of the vegetable gardener, in order to retain their services, which, from their continued service and consequent experience, have now become so valuable.

7. *Vegetable garden.*—As was reported last year, the rich foamy top soil of the greater part of the vegetable garden, together with the whole crop of vegetables, was washed away by the bursting of a bund immediately above it. About one-half of the garden does not appear to have suffered permanent damage and the crops are much as they were before. The other half, however, is for the time ruined, and it will take two years more to get good vegetables from it. The gardener, Maung Tu, however, who is an "Engtha," is an energetic and painstaking man, and in spite of all his difficulties has continued to raise some excellent vegetables and keep up a good rotation. The removal of my headquarters from Fort Stedman here has enhanced the demand for, and consequently the value of, the vegetables raised. It is a great boon for the European population to be able to get good European vegetables, and the European population is as yet too small to make it worth the while of the villagers to grow European vegetables. The garden has therefore been kept up during the year and has very nearly paid its way, in spite of the destruction done to the soil by the flood and of the wages of the gardener being raised from Rs. 12 to Rs. 15 a month. Rupees 188 has been realized by the sale of vegetables, or double that of last year, and the cost of the garden has been Rs. 190, or Rs. 43 in excess of last year.

The excess is caused by the increase of pay of the gardener for the latter portion of the year.

8. *Wheat.*—Last year I pointed out how the start I had been able to make in getting the cultivators to grow wheat was likely to be entirely thrown away and the growth of wheat discontinued, because the Commissariat Department had given the contract for the supply of wheat to the troops in the Southern Shan States to a Native of India at an impossibly low figure instead of to a local man.

I regret to say that my fears and forecasts have only been too truly verified.

Last year I stated that one lakh of pounds of wheat had been supplied to the Commissariat contractor, and that up to the time of writing that report no payment had been received. Up to the present only half the sum due has been realized, and that has been paid to the credit of Government to repay the cost of seed, which is debited as an agricultural advance amounting to Rs. 7,976. The sum still due by the contractor I can neither get from him nor from the Executive Commissariat Officer, Meiktila, at whose request the wheat was made over to the contractor. I am now taking measures to file a civil suit for the balance due in the Court at Pyinmana, where the contractor resides. There was an opposition purchaser to the contractor at the time and the opposition was ready to pay cash down. At the special request, however, of the Executive Commissariat Officer, Meiktila, and of the Officer Commanding Fort Stedman the 100,000 lbs. were made over to the con-

tractor. This enabled him to carry out his contract for some months, but he failed in the end, when it came to importing wheat at Rs. 9 to Rs. 10 per 100 lbs., his contract rate being Rs. 5-11-0. Having, at the request of these officers, supplied the contractor with 100,000 lbs., he would purchase no more when it came to paying cash.

The main crop therefore remained still unsold and amounted to some 250,000 lbs. In July-August the weevils attacked it, and to save it from their ravages quicklime was spread at the bottom of the granary, in the middle of the grain, and on the top. When the grain was removed the lime, which had more or less slaked, became mixed up with the grain. The grain had been saved from weevils and was full and as bright and as good as ever. It had to be sifted, however, to get rid of the lime. The crop was garnered in March-April 1894. By June 1894, the date of my last year's report, the cultivators were clamouring for the Commissariat to take it over and pay for it.

From June to October the land for the next year's crop has to be prepared.

It is little wonder that no steps were taken to prepare land when the previous year's crops remained unsold.

If not purchased by the Commissariat, the weevils might as well eat it as not, as it would not pay the cart-hire to send it down to the railway.

Things remained thus, the cultivators clamouring for the Commissariat, for whom at my instigation they had grown it, to take over the crop and to pay for the 100,000 lbs. already supplied to their contractor. Their land remained untilled awaiting payment, when at last the contractor failed. The Executive Commissariat Officer, Meiktila, then wished to take all the wheat there was, about 250,000 lbs., but the Officer Commanding Fort Stedman called a committee of his Native Officers, who condemned the wheat as being unfit for food in consequence of the lime which was mixed with it—another disappointment for every one, and to none more so than myself, who felt responsible for having induced Government to venture nearly Rs. 8,000 in seed and over a hundred cultivators to venture their land and labour for a whole year upon the growth of this cereal. I sent a sample to the Civil Surgeon for report. He reported favourably. I then sent a sample to the Government Analyst through the Revenue Secretary explaining the straits we were all in. The Government Analyst having reported favourably, the Commissariat at last took it and the troops ate it. It was perfectly good, sound wheat the whole time, and the cultivators had my support, and yet it was not until the month of April-May 1895 that they received payment for the crop they reaped in March-April 1894, and then the price was reduced from Rs. 8 per 100 lbs., which it obtained the year before, to Rs. 6, the Government demand for seed had to be deducted from that, so that what reached the cultivators' hands was only Rs. 3-5-4 per basket of 105 lbs. The original crop, in consequence of the drought, as explained last year, only produced threefold, *i.e.*, for each basket sown three baskets were produced on an average. One of these baskets had to be refunded for seed supplied, one was sold, and one would under ordinary circumstances have been kept for sowing in the following year. The return, however, for the risk run and the time they were kept out of their money was not good enough, and all, or nearly all, was sold. The wheat bubble has burst, leaving much disappointment and loss of time and labour behind it.

In spite of these drawbacks a few put in wheat, but the total crop garnered in March-April 1895 has not exceeded some 50,000 lbs. As this was grown from their own seed and has already been sold to the Commissariat contractor for Rs. 6 per basket of 105 lbs., it is hoped that the growth of wheat may yet survive the blow, but I dare not offer any further encouragement or induce Government to spend any more money in it.

It must be left now to natural growth, one result of which is that the Commissariat contract rate has already grown from Rs. 5-11-0 per 100 lbs. to Rs. 6, and it is quite certain that the contractor cannot supply at that rate.

As soon as he has converted all the local supply into cash, buying at Rs. 6 and selling at Rs. 6, he will fail like his predecessor, and so it must go on until the rates that obtained previous to the commencement of my labours in this behalf in 1892 are reached, namely, from Rs. 9-8-0 to Rs. 12 per 100 lbs.

The contract last year (and I presume this year more even is required) was for 8 lakhs of lbs. It is an easy calculation what the excess annual charge to Government in its Commissariat Department must be. If the paltry sum of Rs. 10,600 that I begged the Commissariat Department to sacrifice last year, so as to keep the contract in the hands of a local man, had been granted, what a very different report I should now have had to write.

The troops would be living entirely upon home grown wheat at, say, Rs. 4 per 100 lbs. They must now subsist on wheat principally imported from India, and that cannot be landed here under Rs. 9 to Rs. 10 per 100 lbs.

9. *Wheat as a taungya crop.*—In order to ascertain whether wheat could be profitably grown as a taungya crop by the people generally instead of the everlasting paddy, which now scarcely pays for growing, a further series of experiments were conducted in the orchard between the fruit trees and in the new extension, following the potato crop. As it is not likely that the growth of wheat will increase and spread beyond the Nyaungywè

valley, even if it still retain a little vitality there, after last season's experiences, these experiments are of little value, but they may be briefly stated as follows:—

No. of plot.	Seed sown.		Crop realized.		Date of sowing.	Remarks.
	Baskets.	Byis.	Baskets.	Byis.		
1	...	6¼	...	...	26th July 1894	1 acre.
2	...	6	...	4	28th July 1894	1 acre.
3	...	10	1	...	31st July 1894	2 acres.
4	...	11	1	...	2nd August 1894	2 acres.
5	1	8	2	8	8th September 1894 ...	3¾ acres.
6	2	8	3	12	17th September 1894 ...	5¾ acres.
7	1	15	21	...	27th September 1894 ...	3¾ acres.
8	2	2	22	...	3rd October 1894 ...	4¾ acres.

Plots Nos. 1, 2, 3, 4, 5, 6 were on red clay and on hill slopes, so they were sown early.

The rainfall, however, was abnormal and it may be said practically not to have ceased to come down in continuous and heavy showers all through the month of August-September and up to the middle of October. The wash on the hill slopes was so great that the roots became a good deal exposed. The seed had to be sown when the land was not in a fit state to work from the constant rain.

The wheat on all the plots grew well in spite of the wet for some time, but plots Nos. 1, 2, 3, and 4 began to show signs of rust while the rain was still falling, and when it ceased about the middle of October and the sun came out, it collapsed at once and became completely brown with rust. The outturn was not so much as the seed sown.

Plots 5 and 6, though not quite so bad, suffered in the same way, though to a lesser extent as they were sown later.

Plots 7 and 8 were not on hill slopes and were for the most part good black loam. Although sown later, they only just escaped the same fate as the others, and had they been sown a week earlier, or had the heavy rainfall continued a week longer, rust would have completely destroyed these also.

As it was the leaves were a good deal rusted and the growth thrown back, but they just managed to survive and realized tenfold.

The result of the experiment taken in continuation of those last year would appear to substantiate the fact that red clay soil is not suited to the growth of wheat.

Sowing in suitable soil on hill slopes in July, August, and September will give a good return if the rainfall is scant or normal, but when heavy, it will not repay the cultivator.

The middle of October is the earliest safe date for sowing in good loam on the flat, and sown then excellent crops are almost a certainty.

The cost of these experiments in wheat was Rs. 351. The crop realized Rs. 247, so that the cost of the experiment was practically nothing.

10. *Potatoes.*—The growth of potatoes was even more extensive than ever in the Myelat, and the market was so flooded with them that the prices fell very low indeed.

Last year from Rs. 25 to Rs. 35 per 100 viss was realized. This year the highest rate I have heard of was Rs. 9 per 100, and those that sold at that were few and fortunate, for the majority sold at Rs. 4 to Rs. 6.

The Bawzaing Ngwegunhmu grew 7,500 viss, a large crop. As the rates in the Myelat were so low he kept them for some time, sent them down to the railway for sale, and there sold 3,500 viss at Rs. 12-8-0 per 100. At the end of April the remaining 4,000 viss were still lying there unsold. The fact is that the crop generally was a heavy one and the prices ruled low; accordingly in the early season when the crops were dug those that could afford to do so held back, and when they came to sell, they were met by a stream of Bengal potatoes just coming in fresh and plump and well looking.

The Myelat potatoes, which had been stored for some months, were more or less shrivelled and dry-looking. The Bengal potato was therefore preferred. The profits on potato-growing this year are generally *nil*.

Paddy would have been almost as good a crop, and that has never been cheaper than this year. The growth of potato in the Myelat has no doubt received a check, and there was no demand for my seed of the kidney variety, so I have put in another crop, and this year, with the short growth, the prices will probably go up and a demand for good seed be set up again.

As soon therefore as the reaping of the experimental wheat plots in the orchard extension was over, the stubble was dug in and potatoes at once planted on about 18 acres of it.

During the current year therefore last year's crop of potatoes was dug in August-September in this new extension. The wheat was then sown in August, September, and October and reaped in February-March 1895, and in March the whole land was once more laid down in potatoes. So far those that have come up look exceedingly well, but at least one-half of the seed put in has not germinated. The tubers were most of them cut into sets and put in, and as we had no rain until the end of April, and the ground was hot and dry, I imagine that the cut-sets perished and rotted before the first shower came to their relief.

The seed was as good as it could be; it was selected and stored from the crop dug in August, yet certainly from one-half to two-thirds have failed to germinate. They were put in under the superintendence of Mr. Colyear while I was on tour.

The crop that was in the ground when I wrote last year's report proved to be excellent when dug.

The best result was realized from the kidney variety from the Myelat and those home grown which are the same as those imported from India, but the tubers were much finer. I never saw finer potatoes anywhere both for size and eating; they were, when cooked, a ball of flour.

The area sown was 23·20 acres and the seed was as follows :—

	Viss.
Kidney potatoes imported	1,800
Do. from Myelat	750
Do. from last year's crop grown in orchard ...	75
Small round potatoes	700
	3,325

The seed of kidney potatoes imported by the Director of Land Records germinated very badly, and the land in which it was sown had not been well prepared and was newly broken up. The tubers therefore were not as fine as they should be in size, but the quality was excellent. The seed had no doubt been a good deal bruised in its journey from India, hence the failure to germinate. The land had been prepared while I was on tour, and was prepared carelessly and badly, hence the tubers not being as fine as they should be.

The tubers realized from the home grown seed were similar to those from the Myelat seed, but the outturn was much heavier as it was sown in richer soil.

The crop from the small round variety was also a prolific one, but the tubers were, like the seed, small, and consequently, in such a year of plenty, quite unsaleable. They were, however, an improvement on the parent seed supplied by the Director of Land Records in 1892-93.

The result of the experiment may be tabulated as follows :—

Description of seed.	Viss sown.	Viss dug up.	Reserved for seed.	For sale.	Rate at which sold.
			Viss.	Viss.	
Kidney imported	1,800	3,530	4,500	3,626	Rupees 7 per 100.
Do. Myelat	750	4,596		...	
Do. orchard	75	2,020	...	2,020	Ditto.
Small round	700	4,568	...	4,568	A few were sold retail at Rs. 10 per 100, but the majority found no buyers.
Total ...	3,325	14,714	4,500	10,214	

On the 23·20 acres sown the outturn was therefore 14,714 viss.

It is no use to strike an average per acre, as they were partly sown in the intervals between the fruit trees. Roads, drainage spaces, &c., are also included in this area, so that probably not much more than half the area was actually occupied by the crop.

The outturn was under fivefold, the average being spoilt by the short crop realized from the imported seed. From the Myelat seed sixfold was obtained, and from the home-grown seed, which was sown on the flat in deep rich loam, as much as twenty-sevenfold was realized.

Having dug a good crop and put aside 4,500 viss of selected seed tubers for sale to those who required seed, or for future sowing, there was a balance of 10,200 viss for sale. They were dug up in August and September and stored as I could find no purchaser. Up to the time I left on tour, 28th December, there was still no purchaser except for the few required by the local population. Carts could not then be procured at any price to take them to the railway, and so matters went on until the following February, when the tubers had shrivelled a little and a good many had rotted. In despair, early in March 34 cart-loads were then sent down to the railway, cart-hire being at its cheapest. After a great deal of haggling and considerable delay, my overseer, Maung Sè, under whose charge they were

sent, managed to sell 1,502 viss of the fine kidney potatoes in small lots at an average of Rs. 7 per 100 viss, and 377 viss of the small round ones, by retail, at an average of Rs. 10 per 100 viss. The balance of 300 viss of kidneys and 2,500 viss of small round were then made over to Maung Yaing, a Shan broker there, to sell and to pay the balance of cart-hire due. He now reports his inability to sell any of them, that they have all rotted, and that there is a balance of cart-hire due of Rs. 25 upon the whole consignment.

From the above it will be seen that the difficulty up here is not to grow either wheat or potatoes. The difficulties commence after the crops are garnered. To the excellent quality of the potatoes any person who has this season visited Taunggyi and eaten them will, I am sure, testify. It is a consolation to know that I was not the only sufferer; the Ngwegunhmu of Maw Sang, for instance, who is so much nearer the railway. In the year 1892-93, after digging the crop as well as was possible in the wet and sticky state of the soil, I found almost as many potato plants come up self-sown all over the ground as were originally planted. These were dug and eaten by the garden coolies and others. It occurred to me from this that I might try how a cold-weather crop would answer, and on the 29th of November I therefore put in 79 viss of seed in a small plot of 1½ roods among the fruit trees. They germinated well and were not killed by the frosts, being in a warm and protected situation, and in the month of April I dug up 150½ viss as an outturn. The outturn was disappointing as the plants grew strong and well. A little manure would no doubt have assisted them. The tubers were good, but not as fine as the parent crop grown in the rains. The result, however, is so far satisfactory that it proves that two crops can be grown in the year, and that, instead of storing seed potatoes from one rains to another, the seed should be sown for a cold-weather crop and the produce of that crop sown again for the rain crop, and so have a constant rotation. It is, however, of no use to try and get the cultivators to do this until there is a railway to carry their produce away, when they would be sure of a sale.

The cost of labour on these potato experiments has been Rs. 660-8-0. The sales have realized only Rs. 504-5-2 notwithstanding the success in raising crops. As a set-off, however, there is the crop now in the ground, which, if it does not rot unsold, should pay its way and do something towards paying for the upkeep and planting up of the orchard.

11. *Orchard.*—The original 20½ acres, as already stated, is completely planted up with European fruit trees and stock for grafting on to. Plantains are growing in between the trees, which are 20 feet apart, which will be cut away as the fruit trees require more room.

A good many of these have been replaced by plum stock, as I had more than I required, and they will be similarly treated when the time comes.

Mr. Colyear has been busy budding and grafting on the apple, pear, peach, and plum stocks that have not yet grown too mature, and cutting back the stocks of 1892-93 that have got too large. The fruit trees have also all been pruned back, and things are beginning to look more as they should be.

The strawberries have been a wonderful success. They commenced to fruit in December 1894, and the last dish was gathered in the commencement of this month. Since then the rainfall has been heavy, and although still flowering the fruit does not set. The berries are fairly large, but not as large as they are grown in England. The flavour is excellent, and in the dry weather months the beds were red with them, they were so numerous.

Several of the peach trees put in in 1893 also fruited freely and the fruit was as fine as one ordinarily sees grown on the garden walls in England and as well flavoured and luscious.

They only commenced to ripen, however, after the rains had commenced and insect life was at its worst. When the fruit was almost fully grown and had got its fine red bloom the birds and insects attacked all the trees and played such havoc with them that in order to rescue a few, I picked them and ripened them artificially.

A good many of them ripened in this way, but they were not like those few that were allowed to ripen on the trees. Next year some arrangement must be made for preserving them from these pests.

I hope next year Mr. Colyear will be able to organize some way of bringing these fruits into the local market for sale.

This year he made a sort of an attempt to do so with the strawberries with no success. He is greatly handicapped in not being able to talk to the natives of the country, and the men under him are all such.

It is too early yet to say how far he has been successful with his budding and grafting, but as far as I can see a good many are taking.

He seems to take a great interest in his work, and when he has settled down to his life in this strange country and can make himself understood to the garden labourers, he will no doubt manage better. The old bamboo fence put up in 1892 is now falling down, but in most places the "subo" prickly fence then sown is now sufficient protection and will take the place of the bamboo fence without having to renew it except in a few places.

This is certainly a great success, and I am planting the same for the Public Works Department round the compounds in the station.

It is at once effective, pretty, and cheap.

The filberts, cob-nuts, gooseberries, and currants are still alive and certainly have made a better start this year than they ever did before.

It is possible that as they get more firmly established they may yet succeed.

The walnuts have made an excellent start, and I am no longer in doubt about their succeeding.

Raspberries are at present a failure as far as fruit is concerned. They grow and thrive so well at the roots that I have constantly to cut away the suckers. Enough plants have been thus removed in the year to have planted several acres. Yet there is no sign of fruit beyond an odd one here and there. I am puzzled at present what to do for them.

On the whole the berries from the strawberry plants imported from England were the finest, though there were some particularly fine ones both for size and flavour from a few of the seedlings raised from Sutton's seed and those from Kew. These have been carefully marked and when the time comes the runners from them will be planted out.

12. *Jerusalem Artichokes and Rhubarb.*—These really pertain more to the vegetable garden, but the soil there does not suit them.

The rhubarb was most flourishing and did well until the heavy rain set in in August. The rainfall, as already stated, was most abnormal in continuance and quantity and most of the plants rotted. Those that lived, and some more imported from India this year, have been planted on raised beds.

A good many of them have at present shown no signs of vitality and I fear have rotted.

There are, however, a considerable number that are doing as well as they did last year, and being on raised and well-drained beds, I hope they will supply us with a good stock for next season.

The Jerusalem artichokes gave an abundant crop of first rate tubers. These I had intended to leave in the ground during the dry months, but Mr. Boxall advised me to lift and store them and I listened to his advice. The bulk of those stored rotted and those that were put out in March by Mr. Colyear have as yet not shown above ground. I fear they also have rotted and I shall once more have to import for next year.

If I had followed my own original intention and left them in the ground, I believe I should have done better.

Next time I shall certainly try it.

The total expenditure on the orchard was Rs. 4,085-11-4 (*vide* Statement I annexed), which is Rs. 1,458-4-3 more than last year.

A reference to Statement B will explain this excess. The entertainment from the month of November of a highly paid man as head gardener on Rs. 125 a month and the addition of a garden labourer on Rs. 12 for the year has raised the cost of establishment from Rs. 545 to Rs. 1,307.

The following items are also extraordinary and not recurring when once the orchard is planted out:—

	Rs.	A.	P.
Buildings	1,075	4	0
Railway and steamer fares for head gardener	109	5	0
Making roads	50	0	0
Cost of and planting trees and cart-hire for same ...	1,140	0	0
Baskets for putting plants	57	12	0
Total	2,432	5	0

The house built for the head gardener cost Rs. 1,000 and is of a semi-permanent nature and will last for many years.

All the roads required are now made.

During the next year or two plants should be imported and after that the heavy item of purchase and planting of trees should also disappear, and with them there would be no further need of the baskets to pot them in on arrival.

There are other items, such as Rs. 64-4-0, for digging drains which should not recur; making shelter for young trees Rs. 29-10-0; purchase and repair of carts Rs. 35. Deducting these items, which combined amount to Rs. 2,561, the money spent on the upkeep of the old orchard and the additional extension of the 20 acres is Rs. 1,524-8-4 only.

13. *Concluding remarks.*—The result of the experiments for the year may be summarized as follows.

The growth of almost all the trees and plants tried has been an unqualified success.

The financial results of everything tried except vegetables has been an unqualified failure.

Nothing but a railway or an enhanced local demand can improve this to any great extent.

The growth of potatoes and wheat must be left to work its own way for the future. To over-stimulate the growth is to enhance its chance of being in the end given up altogether.

By not over-growing a good local market may still be had, and by keeping the growth in small quantities alive, an increase to any extent may be confidently predicted when the time comes that the produce can be sent down by rail or tramway, or when the European population has largely increased.

To over-stimulate now would probably put an end to it all before that time arrives.

The Chiefs are much interested in the orchard operations. Like children the budding and grafting, being a new plaything, has attracted their attention and all want to commence at it immediately. The time, however, has not yet come for setting them up with grafted trees to grow in their own gardens.

It is, however, a mere matter of time to see our European fruit and vegetables common throughout the States.

So far the Deputy Conservator of Forests has been unable to do anything towards roadside planting or planting up the out-stations.

This year I have commenced at Taunggyi by planting prickly fences round the compounds of the Government buildings in Taunggyi and in putting down seed for trees to plant on the roadsides next year.

This is done by the orchard staff without prejudice to the work necessary in the orchard.

At Thamakan Mr. Giles has also made an excellent start, and his successor, Mr. Browne, is keeping it up. Round the bleak station of Thamakan, where not a tree was to be seen, there are now about 1,000 young trees planted and doing well. In time there will be ample shade from wind and sun, and instead of going 12 and 15 miles for firewood it will be available at hand.

The trees are supplied and put in and fenced by the Chiefs of the Myelat under Mr. Giles' encouragement and guidance, and there has been no demand upon this grant for pecuniary assistance.

I shall be glad, as intimated in my report of last year, to see the Forest Officer also make a start in the same direction.

It would be a boon to all and need cost little but his own spare time and that of his establishment.

TAUNGGYI:
The 14th June 1895.

A. H. HILDEBRAND,
Superintendent and Political Officer,
Southern Shan States.

STATEMENT I.—*Actual total Receipts and Disbursements from the 1st June 1894 to the 31st May 1895 (year under report).*

Receipts.	Amount.			Disbursements.	Amount.		
	Rs.	A.	P.		Rs.	A.	P.
1. By budget allotment ...	5,140	0	0	1. On orchard	4,085	11	4
2. By sale of vegetables ...	*187	15	0	2. On garden	190	0	0
3. By sale of potatoes ...	†504	5	2	3. On potatoes	660	8	0
4. By sale of wheat ...	‡265	3	2	4. On wheat	351	0	0
Total ...	6,097	7	4	Total ...	5,287	3	4

*Rs. 44-0-3 credited to this head in June 1895.
† Rs. 85-1-11 still to be recovered creditable to this head.
‡ Rs. 247 outstanding. To be paid in June 1895.

STATEMENT II.—*Details of Disbursements from the 1st June 1894 to the 31st May 1895.*

Details.	Amount.		
	Rs.	A.	P.
(1) Orchard.			
(*a*) Establishment	1,307	0	0
(*b*) Clearing jungles	93	12	10
(*c*) Cart-hire for conveying plants	35	0	0
(*d*) Cooly-hire for planting trees	450	9	5
(*e*) Cost of fruit trees	565	13	9
(*f*) Cooly-hire for digging drains	64	4	0
(*g*) Making shelter for young trees	29	10	0
(*h*) Cost of garden tools	89	10	0
(*i*) Making roads	50	0	0
(*k*) Making baskets	57	12	0
(*l*) Purchase and repair of carts	35	0	0
(*m*) Railway and steamer fares for head gardener	109	5	0
(*n*) Herding bullocks	56	6	10
(*o*) Miscellaneous	42	15	6
(*p*) Buildings	1,075	4	0
(*q*) Cost of zinc labels for fruit trees	32	12	0
Total ...	4,085	11	4

STATEMENT II.—*Details of Disbursements from the 1st June 1894 to the 31st May 1895*—concluded.

Details.	Amount. Rs.	A.	P.
(2) Garden.			
(a) Establishment	168	0	0
(b) Purchase of seeds	20	0	0
(c) Cooly-hire for conveyance of vegetables to bazaar for sale	2	0	0
Total ...	190	0	0
(3) Potatoes.			
(a) Conveyance (cart-hire)	187	0	0
(b) Sowing (cooly-hire)	226	14	0
(c) Hoeing (cooly-hire)	156	8	0
(d) Digging (cooly-hire)	90	2	0
Total ...	660	8	0
(4) Wheat.			
(a) Sowing (cooly-hire)	152	10	0
(b) Weeding (cooly-hire)	144	10	0
(c) Sifting and threshing (cooly-hire)	21	14	0
(d) Reaping (cooly-hire)	31	14	0
Total ...	351	0	0
Total Expenditure up to 31st March 1895 (from 1st June 1894).			
1. Orchard	3,222	2	10
2. Garden	160	0	0
3. Potatoes	334	8	0
4. Wheat	330	10	0
Total ...	4,047	4	10
Total Expenditure from 1st April 1895 to 31st May 1895.			
1. Orchard	863	8	6
2. Garden	30	0	0
3. Potatoes	326	0	0
4. Wheat	20	6	0
Total ...	1,239	14	6
Grand Total from 1st June 1894 to 31st May 1895.			
1. Orchard	4,085	11	4
2. Garden	190	0	0
3. Potatoes	660	8	0
4. Wheat	351	0	0
Total ...	5,287	3	4

APPENDIX B.

EXTRACTS FROM THE REPORTS ON THE AGRICULTURAL SHOWS HELD DURING THE YEAR 1894-95.

(a) Akyab Show, held 9th March 1895.

(i) Remarks by the Commissioner, Arakan Division.

* * * * *

"The Deputy Commissioner informed me there were no entries, or I should have been present."

(ii) Remarks by the Deputy Commissioner, Akyab District.

* * * * *

"There is very little interest taken in this district in these shows, and no keenness to compete. I am afraid it is not likely that there will be any for many years to come."

(iii) Proceedings of the Committee.

* * * * *

"Besides myself Akunwun U Mra U, A.T.M., and Honorary Extra Assistant Commissioner Maung Myat Kyi and about 35 persons.

"The show was held in the Government School compound and no special structure was erected for this purpose. Exhibitors were allowed only from the Akyab and Urittaung townships.

* * * * *

"The fact that the show was to be held was widely circulated and was well known; but no one from the Urittaung township brought any exhibits. The exhibits that were brought were all from Akyab township.

* * * * *

"Maung Myat Kyi, the Township Officer, went out to his township in the evening previous to the day of the show and induced some of the principal cultivators to bring their exhibits, otherwise the show would have been an utter failure.

"There were only two bulls exhibited * * For plough oxen there were three competitors * * For the best sample of rice one competitor exhibited * * Two persons exhibited a sample of paddy * * For a brood of chickens there was only one *bonâ fide* competitor." * * *

(*b*) *Thônzè* (*Tharrawaddy*) *Show, held 9th March 1895.*

Remarks by the Deputy Commissioner, Tharrawaddy District.

* * * * *

"I have the honour to submit my report on the agricultural show held at Thônzè on the 9th March 1895. I also attach a list of exhibits and a list of prize-winners.

"2. A sum of Rs. 400 was allotted for the show: of this amount Rs. 365 was given away as prizes and the balance Rs. 35 was paid back to the treasury (*vide* chellan No. 3, dated the 11th March 1895).

"3 The judges of exhibits 1 to 6 were Mr. Bailey, Executive Engineer, Dr. Roberts, Civil Surgeon, and Maung Po Thaik, Subdivisional Officer. These gentlemen went round and visited all these exhibits a few days before the show day. Ten wells were entered for competition; the best was (as was to be expected) found in the garden of U Chin Kè, an enterprising Chinaman of Thônzè.

"4. For best bunds there were only three competitors and the prize was adjudged to Maung Mali, Thugyi of Magyi chaung village. Of the five fruit gardens entered four belonged to U Chin Kè, who came in first easily. The prizes for vegetable gardens were both taken by Chinamen. The prize for cattle-sheds was taken by Maung Po Kan of Thônzè, who also got the first prize for the best bull, the best milch cow, the best bull buffalo, best half-bred stallion, best flock of geese, and best peas. Prizes 8 and 12 were amalgamated and, with the savings under other heads, seven money prizes were awarded for bullocks. The first prize fell to Maung Tun Maung with the same pair of bullocks that won the first prize in 1893.

"5. The exhibits most worthy of notice, taken in their order of merit, were bullocks, bulls, cocks, and hens. The bullocks were an exceptionally good lot, and so many were adjudged meritorious that it was agreed to award more prizes. The bulls were few in number, the best being Maung Po Kan's Nellore bull, a very fine animal, and the second best being his son out of a Burma cow. Only one pure Burma bull was exhibited and he was not a good one. The supply of cocks was large and surprisingly good, but, curiously, very few hens were exhibited. To encourge the people Mrs. Bailey and Mr. Slade of Tharrawaddy exhibited some very fine Cochin-Chinas, which would have secured the prizes had they been entered for competition. Amongst the other exhibits milch cows were a very poor show, which, I fancy, was due to the milk-vendors, who are all natives of India, being under the impression that they could not get prizes. The bull buffaloes were good, but the exhibits few in number.

"Although prizes were offered for Burman or Shan stallions, there was not a single entry. On the other hand, four half-bred stallions were entered, and they were a distinctly poor show, all wanting in bone and most of them with very poor quarters. The first prize was given to Maung Po Kan for a smart little son of "Bandoola" and second and third prizes of Rs. 5 were given to two other exhibitors as some recompense for their trouble and to encourage them. The rice and paddy exhibits were very good, but there were only 11 exhibitors, which is very few for an agricultural show. The other exhibits do not require particular mention.

"6. *General.*—The show was held on the old ground of 1893, Payataga U Lu Nge having kindly placed his zayats at the disposal of the Committee. The show was attended by a vast concourse of people variously estimated at from 3,000 to 5,000, who all seemed to take a keen interest in what was going on. The judging took place in the morning. The Judges were—

Mr. Mathews, Director of Land Records and Agriculture.
Captain Evans, Veterinary Department.
Mr. Bailey, Executive Engineer.
Dr. Roberts, Civil Surgeon.
Mr. Palmer, Superintendent of Land Records.
Maung Po Thaik, Subdivisional Officer.
Maung Hmo, Township Officer.
U Tha Dun Byu, Public Works Department.
U Lu Nge.
U Pan Tha.
U Tun Aung.
Mr. D. Ross, Officiating Deputy Commissioner.

Mrs. Bailey also very kindly assisted in judging the poultry.

"In the afternoon the show was visited by Mr. Smeaton, Financial Commissioner, who distributed the prizes and afterwards delivered an address to a large and attentive audience. After the distribution of prizes sports were held and were much enjoyed by the assembled crowd. The show was entirely successful, and I attribute this chiefly to the interest and trouble taken by the Subdivisional Officer, Maung Po Thaik, whose arrangements were admirable and whose zeal was unflagging. I ought not to conclude without mentioning U Tha Dun Byu (Public Works Department) and his wife, who both helped to make the show a success.

"7. For the guidance of those in charge of future shows I record the following remark. I would not offer any more prizes for best fruit gardens. No one is ever likely to come near Chin Kè in this line, and it serves no useful purpose to go on giving him the first prize year after year. There ought to be more prizes for bunds. Any one who knows how scarce good water is in this district in March and April will easily understand the necessity of this.

"I do not think that any prize should be given for half-bred stallions; the breed has proved itself a failure and should not be encouraged. Everything should be done to stamp it out and to get back to the old Burmese breed. I do not think, however, that Tharrawaddy district is at all adapted to pony-breeding, and I would not waste money on it when we have the whole of the dry zone of Upper Burma for the purpose.

"I think the scope of the show should be enlarged so as to include industrial and art exhibits. I do not see why we should not have specimens of Burmese painting, carving, and silver work. Tharrawaddy is not a great weaving district, but this branch of industry might well be encouraged also. Pottery, brick-making, even the making of dilon, should all be encouraged, also fishing apparatus and such like. To this end I would propose a grant from the District Cess Fund to supplement the prize money. If we wish to attract good bulls, buffaloes, horses, &c., we must be prepared to give prizes sufficient to cover the expense of bringing the animals to the show."

(c) *Henzada Show, held 19th March 1895.*

(i) Remarks by the Commissioner, Irrawaddy Division.

* * * * *

"The show was not a success, but the next one may be expected to show greater interest and will be looked forward to by the people."

(ii) Remarks by the Committee.

"The agricultural show was held at Henzada town at an open space a few hundred feet distant from the court-house and was open to the following townships of the Henzada, Thôngwa, and Bassein districts:—

1. Henzada.	4. Zalun.
2. Ôkpo.	5. Danubyu.
3. Lemyethna.	6. Kyônpyaw.

"Printed copies of notices in English and Burmese were received in January 1895 and were circulated widely in the Henzada and Myanaung subdivisions of this district.

"The Committee consisted of—

T. C. Mitchell, Esq., Deputy Commissioner (absent).
Maung Ba Tu, Subdivisional Officer, Henzada (absent).
E Lu Gale, Akunwun, in charge Land Records office.
Maung Po Han, Township Officer, Henzada (absent).
Veterinary-Captain G. H. Evans, Superintendent, Civil Veterinary Department.

"The erection of the show-yard was undertaken by E Lu Gale, Akunwun, who was in charge of the Land Records office on the 18th March 1895, and through his exertions the yard was ready for use on the following morning.

"The only other officer present in the station besides the Akunwun was the Treasury Officer Maung Pe.

"The exhibits were judged by the Committee between 9 and 11 A.M. Five elders from the town assisted in judging, especially the agricultural produce.

"The following were the prizes awarded:—

1. *Best pair buffaloes.*—Only 2½ pairs were exhibited by cultivators from the town of Henzada. The animals were well-bred and strong.
2. *Best pair bullocks.*—Six pairs were exhibited; all were strong ones. Two prizes were awarded for best pair of draught and ploughing bullocks and a third prize for a pair of ploughing draught bullocks.
3. *Best bull buffalo.*—No exhibit.
4. *Best bull.*—There was only one exhibit by Maung Ba of Henzada. It is a fine Indian bull.
5. *Best cow.*—Three kinds were exhibited. First prize was awarded for a fine and strong Indian cow, and second was for a well-shaped Burman cow.
6. *Best pony (stallion).*—No exhibit.

7. *Best pony (gelding).*—Five ponies were exhibited. Of these five two prizes were awarded.
8. *Best sow with litter.*—No exhibit.
9. *Best boar.*—Only one exhibit. The animal was a very fat one and was about four or five years old.
10. *Best pair geese.*—Three pairs were exhibited.
11. *Best pair ducks.*—Only one pair was brought to the show and the Committee did not think it worth while to award any prize for it, though it was a fair one.
12. *Best pair fowls.*—One dozen pairs were exhibited and two equal prizes were awarded for a pair of best Indian fowls and best Burman fowls.
13. *Paddy.*—Several kinds of paddy were exhibited.
14. *Gram.*—Only one prize was awarded as there were only two exhibits.
15. *Beans.*—No exhibits.
16. *Millet.*—No exhibits.
17. *Indian-corn.*—No exhibits.
18. *Tobacco.*—There were eight exhibitors. The exhibits were the produce of the Henzada district and they were good.
19. *Pumpkins and gourds.*—The exhibits were many, being no less than a dozen. Equal prizes were awarded for three gourd fruits which were as big as an ordinary water-pot.
20. *Yams and sweet potatoes.*—Only one prize was awarded as the exhibits were few.
21. *Cucumbers and melons.*—No exhibits.
22. *Plantains.*—Only one exhibit. A nice bunch.
23. *Chillies.*—The chillies exhibited were nice and big ones.
24. *Other classes.*—A prize was awarded with certificates for the best tomato and brinjal.

"From the above it will be seen that the show was not altogether a success and the prizes were awarded in accordance with the opinion of the Committee that by so doing the villagers would be encouraged and the show next year would prove a success. The prizes and certificates were distributed the same evening at 5 P.M. by Mrs. Newland.

"The following gentlemen were present on the occasion :—

Mr. J. T. Simpson, Executive Engineer.
Mr. E. G. Durrant, Assistant Superintendent of Police.
Mr. E. R. Newland, Solicitor.
Veterinary-Captain G. H. Evans, Superintendent, Civil Veterinary Department.

"The object of the above show was explained in Burmese to the people.

"The total amount spent in the distribution of prizes was Rs. 170 and a further sum of Rs. 26-9-0 was expended in the erection of the show-yard, thus leaving a balance of Rs. 103-7-0 from Government grant.

"I regret that I was unable personally to be present at the show. The matter had not been before me recently and I arranged a trip to the interior for about the same time, not having made a special note of the date of the show. Under any circumstances the show came off fairly well."

(*d*) *Moulmein (Amherst) Show, held 5th February 1895.*

Remarks by the Committee of the Agri-Horticultural Society.

* * * * *

"Out of the allotment sanctioned by Government there is a balance of Rs. 160 in the hands of the Society, which it is hoped will be utilized in increasing the value of prizes offered for competition at the next show.

"The show was held as arranged in conjunction with the Horticultural show of the Tenasserim Agri-Horticultural Society at Salween Park. It was expected that a larger number of entries would be made than last year, and for this reason accommodation on an increased scale was provided. I regret, however, to report the exhibits were not only fewer, but of a poorer class than the previous show, so much so that the judges awarded only second prizes to the animals exhibited. It is generally supposed that the prizes are not sufficiently large to induce owners of cattle to bring animals in from a distance for exhibition. The samples of paddy were of the usual quality and nothing approaching what can be produced at Bilugyun.

* * * * *

"Some very fine samples of nutmegs, cloves, and pepper in an unripe state were exhibited from Amherst, and there can be no doubt with a little encouragement from Government the cultivation of these valuable spices would be extended.

"Fruit and vegetables were well represented, particularly the former. The judges were Messrs. MacLeod, Shaw, Maung Shwe Thwin, Maung Ngwe Kaing, Akunwun, and the Honorary Secretary.

"The attendance was, if anything, larger than last year, the pwès kindly arranged by the Assistant Superintendent of Police Maung Tun Min and Advocate Maung Shwe Thwin being well patronized from noon until the close of the show. Mrs. Spearman very kindly distributed the prizes and certificates to the successful competitors, and at the same time the object of holding agricultural shows was explained to them."

(*e*) *Mandalay Show* (*not held*).

(*f*) *Myinmu* (*Sagaing*) *Show, held 7th April 1895.*

Proceedings of the Committee.

"The first agricultural show of its kind was held at Myinmu on the 7th April 1895 and was open to the Sagaing and Lower Chindwin districts. No exhibitors from the Lower Chindwin district, however, presented themselves, and it was stated that the heat and the inconvenient date fixed (which clashed with the Burmese new year) combined brought about this unsatisfactory result. There is no doubt that the date fixed was a month too late on all accounts, and the cultivators were informed at the opening of the proceedings that next year the date would be changed to the Tabaung Labyi in place of the Tagu Labyi. This change of date will, no doubt, materially affect the prosperity of the show.

"Although the idea of the agricultural show was first mooted in March 1894, notices for distribution, fixing time and place, were only actually received two months prior to the date fixed; they were at once, however, widely circulated in both districts and all necessary arrangements towards ensuring success were put in hand.

"A subscription list was started in order to supplement the Government grant for prizes and to meet other expenses in connection with the show and was circulated amongst the officials of the district, who responded liberally. In this way a sum of Rs. 223-12-0 was collected. This amount, in addition to the Government grant of Rs. 400 for prizes and Rs. 150 for miscellaneous expenditure, was more than sufficient to meet all requirements.

"The time allowed for the collection of exhibits in the shape of agricultural produce was, I regret to say, rather limited. Notwithstanding this, however, there was a very fair distribution for a first attempt, but much improvement may be looked for in future years.

* * * * *

"The Subdivisional Officer, Myinmu, Maung Pe, ably seconded by the Township Officer, Myinmu, and the elders of Myinmu town, had made excellent local arrangements and a large and very suitable shape of pandal, a drawing of which was at the special request of the Director of Land Records and Agriculture given to him, had been erected by them on the maidan to the east of the police lines for the reception of the exhibits.

"The Committee consisted of—

(1) Captain Browning, Deputy Commissioner.
(2) Mr. Mathews, Director of Land Records and Agriculture.
(3) Mr. George, Settlement Officer.
(4) Dr. Mukerjee, Civil Surgeon.
(5) Dr. Evans, Veterinary Surgeon.
(6) Mr. Aldworth, District Superintendent of Police.
(7) Maung Pe, Subdivisional Officer, Myinmu.
(8) Maung Tha Dun Aung, Township Officer, Myinmu.
(9) Tha Nyo, Akunwun.

"All members were present. The show commenced with the presentation of an address by the elders of Myinmu to the Deputy Commissioner, who thanked them on behalf of the committee and explained to them the object of Government in holding these shows. Then the judging of the live-stock was taken in hand and here the members of the committee were confronted with a difficult task, which however was successfully tackled by Mr. Evans, who took a great interest in the whole proceedings. Unfortunately time was limited: had it been at all expected that such large numbers of bullocks would have been shown, an extra day might well have been allotted; as it was it is to be feared that some deserving animals were overlooked and that some cultivators left dissatisfied in consequence. Next year it will probably be necessary for all the animals to be gone over one day previously to the actual show by a sub-committee and for all the absolutely weedy animals to be extracted, the remainder being put up for the inspection of the full committee.

"Between 7 and 11 A.M. the live-stock was being judged, the remainder of the exhibits being seen between 4 and 7 P.M. During the intervals of business pony and cart races, as well as boxing, were held, while on two nights there were pwes, monies for these objects coming from the private subscriptions.

"I am of opinion that from 3,000 to 5,000 people were present at the show, which was on the whole very successful.

"Though the exhibition of produce was scanty, the lateness of the date fixed accounting for this in a great measure, the exhibition of cattle was magnificent, both in number and quality, the show of buffaloes in particular being very fine.

"Only one 'bull' was shown and this was a fine half-bred bull exhibited by Mr. Calogreedy of Paledan (who it may be mentioned also supported the show by a handsome subscription).

"As the show progressed the people assembled and showed considerable keenness and enthusiasm. They struggled eagerly for certificates, which they appeared to prize highly, and I am confident that succeeding shows will show an advancement both in the attendance and in the number and quality of exhibits.

"A commencement is everything in these things; and while this year the large majority of the persons present belonged to Myinmu subdivision and were induced to come in by the energy of the Township Officers and the personal interest shown by them in the success of the show, next year I predict that the Ava and Sagaing subdivisions will be equally well represented, and the Lower Chindwin district also, provided that the Township Officers there take anything like the interest in the show that has been exhibited by one and all of the Township Officers in this district. As competition becomes keener, these animal shows cannot but have a beneficial effect on every branch of agriculture.

"There were only two exhibitors of pigs, and poultry was produced only by one exhibitor—Mr. Calogreedy of Paledan, who showed also turkeys. The great heat was the reason for the poor show under these heads. The show of carts was very good and that of agricultural implements was very fair. The first prize for agricultural implements showed the following: One harrow complete, sledge, fork, dama, hoe, kamauk, water-bottle, and a bag containing all the requisites for the man for a day's work.

"I attach a schedule showing the number of exhibits of each kind shown and the prizes awarded as well as the names of successful competitors. From the list it will be seen that special prizes took the shape of certificates in gold letters only, and that first prizes consisted of awards in money as well as certificates in gold letters. The committee decided to award 3rd and 4th prizes also in certain cases, not only as the exhibits were considered exceptionally good, but in order to encourage exhibitors in their first attempts. The total value of prizes in money amounted to Rs. 358 and the exhibition sheds, &c., cost Rs. 328; in all Rs. 686 was thus expended. There is a surplus of Rs. 87-12-0 out of the subscriptions. This sum will be carried forward to next year."

* * * * *

(g) *Kyaungdawya (Minbu) Show, held 8th and 9th March 1895.*

(i) Remarks by the Commissioner, Southern Division.

* * * * *

"The show appears to have been very satisfactory."

(ii) Proceedings of the Committee.

"1. The last Agricultural Show was held at Salin on the 5th January 1893.

"2. The show this year was held at Kyaungdawya on the 8th and 9th March 1895, *i.e.*, the exhibits were brought in on these two days, the show culminating on the full-moon of Tabaung. This locality was selected (i) because it lay conveniently between the two subdivisions; (ii) because of the concourse of people who would be attending the pagoda festival commencing from full moon of Tabaung.

"3. The Committed consisted of—

Captain Johnson, Deputy Commissioner.	Surgeon-Captain Dewes, Civil Surgeon.
Mr. Dobson, District Superintendent of Police (*absent*).	The Township Officer, Legaing.
	The Township Officer, Salin.

"The Settlement Officer, Mr. Laurie, C.S., was likwise present and took a lively interest in the show.

"4. The show was well advertised and was a success as regards cattle and agricultural implements, but a failure as regards poultry, fruit, and vegetables.

"5. I think future shows will give better results as regards poultry. As for fruit and vegetables the prevailing drought must be held accountable for the poor and few exhibits. In any case March is almost too late in the season for such products of agricultural industry.

"6. *Garden fruits and vegetables.*—There were no vegetables exhibited at all. Two exhibitors brought garden fruits; the first prize was not awarded as the exhibits were not good enough, the second prize fell to a Legaing exhibitor for a bunch of golden plantains (thadanet hngetpyaw).

"7. *Agricultural implements belonging to cultivators.*—Five sets were exhibited from Legaing and 44 from the Salin township. Two prizes were awarded with certificates: the first falling to Maung Shwe Tha of Meywagyun (Salin), who exhibited the following implements: spade, hoe, sickle, plough, bucket, threshing-stick, harrow with four teeth, harrow with seven teeth, plank for smoothening surface, plank for carrying plants, harrow with five teeth, hay-fork, bamboo hat, a large basket used in carrying burdens, chopper (commonly called dama), scoop, see-saw scoop.

CATTLE.

"*Buffaloes.*—Only three pairs were exhibited from Salin. The Legaing Township Officer says there are very few in his township. The animals exhibited were well-bred, strong, and healthy and two prizes with certificates were awarded.

"*Agricutural bullocks.*—Thirty pairs were exhibited from the Legaing township and 37 from the Salin subdivision. There were some very fine animals exhibited and in several instances the breed was almost equal to the best Indian breeds. The large hump was prominent in many pairs. The first prize fell to a Salin cultivator, the second to one from Legaing, who had won a prize at the previous show at Salin.

"*Draught bullocks.*—There were 91 pairs exhibited from the Minbu and 31 from the Salin subdivision. The selection took a long time and was an arduous bit of work. Both prizes fell to Salin cultivators, but a special prize was given to Nga In of Legaing township. Some of the breeds were very superior.

"*Bulls.*—There were six bulls exhibited, three from each subdivision. They were not such large animals as the committee were led to expect after seeing the fine specimens of draught and agricultural bullocks. It would be advisable to introduce a few goood bulls from India into the district. Two prizes were awarded.

"*Milch cows.*—There were a dozen exhibits. The cows exhibited were all very small, though in good condition and well shaped (*i.e.*, for breeding purposes). Some were very young and unfit to have calves. One pair (with calves) were yoked to a small cart; this is not generally a Burmese custom, although it is very common in a great agricultural country like France. The committee disqualified this pair. Two prizes were awarded. The cows exhibited gave for the most part half a viss of milk each and were valued at prices varying from Rs. 30 to Rs. 50.

PONIES.

"9. *Stallions.*—There were five stallions brought to the show. Two prizes were awarded to encourage future exhibitors, but otherwise the committee considered the animals were very poor and scarcely fit to be sires; some had been over-used, others were too young. The committee were of opinion that, considering how this and neighbouring districts are cut off from supply of ponies, and considering the large number of mares in the district, that a stallion should be kept for service at Minbu or Salin to improve the stock and increase the supply of ponies.

"*Ponies not stallions.*—Eight were exhibited from Minbu (including two brood mares) and 17 from Salin. The ponies (mostly mares) were of a good class, averaging 12½ to 13 hands. Two prizes were awarded. The committee also awarded the following special prizes: Rs. 5 to Maung San Dôk (Salin) for a fine brood mare and two foals, Rs. 10 to Maung Po Kyaw (Legaing) for a fine foal. High prices were asked for ponies, the average being Rs. 300.

"10. *Ornamented bullock carts.*—Strange to say only two were exhibited. The committee divided the first prize between the two exhibitors.

"11. *Poultry.*—There were no geese and no ducklings exhibited, and only three broods of chickens numbering 20, 21, and 23 respectively; the committee awarded each exhibitor Rs. 5 as an encouragement.

"12. *Stables for cattle.*—There was one stable for cattle exhibited. It was near the Môn river and was inspected by the two Township Officers. The committee awarded the first prize to Maung Kywe (Legaing).

"13. There were no irrigation works exhibited and the contingencies for special prizes and other charges were not touched.

"14. The show was well attended as quite 500 carts had arrived from the Shwezetdaw pagoda on the 8th and kept arriving on the 9th. The committee took advantage of this concourse of people to advertise the fact that a similar show would be held at the same date and place during the two following years 1257 and 1258 B. E.

"15. The financial result of the show is as follows. Amount of grant for prizes, &c., Rs. 400; total amount spent in prizes Rs. 310; balance in hand Rs. 90 (refunded into the treasury). A detailed list of prizes given is attached.

"16. Of the certificates supplied 11 gold and 16 black lettered were granted."

(*h*) *Pyawbwè* (*Yamèthin*) *Show, held 11th March 1895.*

(i) Remarks by Deputy Commissioner, Yamèthin District.

"COMMITTEE.

"Lieutenant-Colonel W. F. H. Grey, Deputy Commissioner—*President.*
Mr. W. W. Forbes, District Superintendent of Police ... } *Members.*
Mr. R. Beale, Subdivisional Officer ... ... }
Maung Nè Dun, Myoôk ... ... }

* * * * *

"The show, being quite a new idea to the people, was not largely patronized, the competitors being entirely confined to the Pyawbwè township of this district. As will be seen the prizes had to be withheld in several cases and in some others were only given with a view to encouragement to future exhibitors."

(ii) Proceedings of the Committee.

* * * * *

"*Wells.*—The best of these was exhibited by Maung Shwe Thi, of Yasagyo village. The masonry is badly cracked and out of repair and no effort has been made to improve it. The committee decide to withhold the prizes in this class."

"Three *bunds* exhibited. These were all found to be broken, the present not being the time of year at which they are required. The committee withheld the prizes."

APPENDIX C.

STATEMENT III.—*Distribution list of seed obtained for experimental cultivation during 1894-95.*

No.	How distributed.		Maize (a).		Tobacco (b).		Vegetable seeds (c).		Wheat* (d).		Potato* (e).		Gram* (f).		Remarks.
	District.	Designation or name of officer receiving seed.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Lower Burma.		Cobs.		lbs.		lbs.		Bkts.		Mds.				
1	Sandoway	Deputy Commissioner	20	30th April 1894 ...	1	22nd September 1894 ...	...	.....	...	...	...	...	...	...	
2	Hanthawaddy	Ditto ...	50	27th April 1894 ...	1	22nd September 1894 ...	...	.....	...	...	...	...	...	...	
3	Bassein	Ditto ...	20	30th April 1894 ...	...	.....	...	.....	...	...	...	...	...	...	
4	Amherst (Moulmein) ..	Secretary, Agri-Horticultural Society.	20	5th May 1894 ...	½	22nd September 1894 ...	...	.....	...	...	...	...	...	...	
5	Amherst	Deputy Commissioner	20	5th May 1894 ...	½	22nd September 1894 ...	...	.....	...	...	...	...	...	...	
6	Tavoy	Ditto ...	30	5th May 1894 ...	½	22nd September 1894 ...	...	.....	...	...	...	...	...	...	
7	Tavoy	Mr. J. D. Watson ...	15	5th May 1894 ...	...	.....	...	.....	...	...	...	...	...	...	
8	Mergui	Deputy Commissioner	20	5th May 1894 ...	1	22nd September 1894 ...	...	.....	...	...	...	...	...	...	
9	Toungoo	Mr. J. Petley ...	15	27th April 1894 ...	...	.....	...	.....	...	...	...	...	...	...	
10	Shwegyin	Deputy Commissioner	10	27th April 1894 ...	...	.....	...	.....	...	...	...	...	...	...	
11	Salween	Ditto ...	...	.....	1½	22nd September 1894 ...	...	.....	...	...	...	...	...	...	
12	Thayetmyo	Ditto ...	50	30th April 1894 ...	1½	22nd September 1894 ...	...	.....	...	...	...	...	...	...	
	Upper Burma.														
13	Pakôkku	Deputy Commissioner	100	30th April 1894 ...	2	22nd September 1894 ...	3	29th September 1894 ...	...	...	...	...	...	...	For the jail garden.
14	Magwé	Ditto ...	50	30th April 1894 ...	2	22nd September 1894 ...	...	.....	...	...	...	...	...	...	
15	Mandalay	Ditto ...	100	27th April 1894 ...	4½	22nd September 1894 ...	3	29th September 1894 ...	...	...	...	...	...	...	
16	Mandalay	Mr. H. N. Hirjee ...	15	27th April 1894 ...	...	.....	...	.....	...	...	...	...	...	...	
17	Bhamo	Deputy Commissioner	50	27th April 1894 ...	...	.....	3	29th September 1894 ...	...	...	...	...	...	...	
18	Katha	Ditto ...	50	27th April 1894 ...	...	.....	3	29th September 1894 ...	...	...	...	...	...	...	
19	Ruby Mines	Ditto ...	50	27th April 1894 ...	...	.....	...	.....	...	...	...	...	...	...	
20	Shwebo	Ditto ...	50	27th April 1894 ...	½	22nd September 1894 ...	3	29th September 1894 ...	...	...	...	...	...	...	
21	Ye-u	Ditto ...	40	27th April 1894 ...	...	.....	...	.....	...	...	...	...	...	...	
22	Sagaing	Ditto ...	30	27th April 1894 ...	2	22nd September 1894 ...	3	29th September 1894 ...	...	...	...	...	...	...	
23	Lower Chindwin ...	Ditto ...	50	30th April 1894 ...	1	22nd September 1894 ...	3	29th September 1894 ...	...	...	...	...	...	...	
24	Upper Chindwin	Ditto ...	40	30th April 1894 ...	...	.....	6	29th September 1894 ...	...	...	...	...	...	...	3 lbs. for the jail garden.
25	Myingyan	Ditto ...	50	30th April 1894 ...	½	22nd September 1894 ..	3	29th September 1894 ...	...	...	...	...	...	...	
26	Chin Hills (Haka) ...	Political Officer ...	...	.....	...	.....	3	29th September 1894 ...	...	...	...	...	...	...	
		TOTAL ...	945	.....	20	.....	33	.....	...	...	...	...	...	...	

(a) American maize (three varieties).
(b) American tobacco (Havannah and Virginia).
(c) English vegetable seeds.
(d) Sagaing and North-West Provinces wheat.
(e) North-West Provinces potato.
(f) Mandalay gram.
* None supplied during the year.

STATEMETN IV.—*Statement showing description and quantity of seeds received, together with the cost of consignment and of distribution during 1894-95.*

Seed.		From.	Received.	Cost of consignment.	Cost of distribution.
Description.	Quantity.				
				Rs. A. P.	Rs. A. P.
Maize ...	950 cobs	America (D. Landreth and Sons, Philadelphia).	14th March 1894.	473 3 3	29 7 0
Tobacco ...	20 lbs.	Ditto ...			3 8 0
Vegetable ...	33 lbs.	England (Sutton and Sons)	10th September 1894.	214 8 3	9 2 6
Wheat* ...	...	Sagaing and North-West Provinces.	...	...	...
Potato* ...	...	North-West Provinces ...	...	...	...
Gram* ...	...	Mandalay	...	...	...
		Total ...	...	687 11 6	42 1 6

* None obtained during the year.

STATEMENT V.—*Experimental cultivation—American Maize.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		LOWER BURMA.	
1	Sandoway ...	Distributed for experimental purposes to Township Officers, Thugyis, and Clerks.	The majority of the maize plants grown from seeds sown by Township Officers and Thugyis grew up to about 2½ to 3 feet in height, but after that withered away. The few that grew up to their ordinary size bore only a couple of cobs. The experiment proved a failure throughout the district. No cause is assigned for this.
2	Hanthawaddy ...	Sown by cultivators in each township.	Although the seed germinated, none of the plants matured properly. In two cases cobs formed, but they contained no grain.
3	Bassein ...	.....	The plants were reported to be strong and healthy, but the seed obtained from the experiment was said to be scanty and small and in every way inferior to the country corn.
4	Amherst (Moulmein)	Experiment conducted by the Tenasserim Agri-Horticultural Society.	The yellow or red variety reported a failure, but the white variety was a success. The original American cob weighed 9 ounces, while that grown at Moulmein weighed over 8 ounces, which is considered very fair. The heavy rains of Tenasserim are very much against the cultivation of maize during the south-west monsoons.
5	Tavoy ...	Planted by Township Officers and cultivators.	With one exception the experiment was a failure owing to heavy rains.
6	Mergui ...	Experiments made in the Myoma; Tenasserim, and Palaw townships.	In Myoma the experiment on the whole was a failure. Only $\frac{2}{10}$ths of the seed germinated, of which ⅓th produced an indifferent crop. The cobs were diminutive and the grains small and inferior in quality. In Tenasserim the seeds were distributed late and therefore failed to germinate. For Palaw no record was available. In both the last-named places the Myooks were responsible for the unsatisfactory results. There is scarcity of soil unmixed with salt in the district; land generally is consequently unsuitable.
7	Toungoo ...	Grown by Mr. J. Petley. The soil at the plantation where seed was sown is of a dark chocolate colour.	The seed was sown in the usual way in May and to all appearance the stalks grew up well, but the cobs were not fully developed, owing perhaps to deficiency of rain. A basket containing samples of the cobs produced was sent for inspection.

STATEMENT V.—*Experimental cultivation—American Maize*—continued.

No.	District.	Particulars regarding experiment.	Result of experiment.
8	Shwegyin ...	Planted by cultivators and by the Superintendent of the District Jail.	The result of the cultivation was not as satisfactory as expected. In some cases excellent results were obtained and in others seeds either did not germinate or the plants died while still small owing to lowness of soil and heavy rains.
9	Salween ...	Seed distributed to cultivators in several villages.	Cultivation was not a success owing to the lateness of sowing. The land was first burnt and mixed with manure, and the seed then sown to a depth of 2 inches and about 4 feet apart. When the plants reached a foot in height the ground was cleared of weeds and earth heaped up round each plant.
10	Thayetmyo ...	Experimental cultivation carried on in the Thayetmyo, Minhla, and Myedè subdivisions.	The experiment was a success in the Taingda township. In the Minhla township the experiment was only a partial success owing to heavy rainfall; the plants were also attacked and destroyed by ants. In the Thayetmyo township the cultivation was very successful and a good outturn was obtained.
		UPPER BURMA.	
11	Pakôkku ...	Cultivated in five circles of the Pauk subdivision, also in parts of the Gangaw and Pakôkku subdivisions.	In four circles out of the five of the Pauk subdivision the experiment was a success. The maize ripened earlier than the indigenous quality. The leaves are much coarser than those of the native plant. The maize in the subdivision in which the experiment was conducted is grown not as a food commodity, but for the leaves which are exported for manufacture of Burmese leaf-cigars. Two baskets of maize leaves were forwarded for inspection. In the Gangaw subdivision the failure was due chiefly to the want of rain. In many cases the seeds did not even germinate. In the Pakôkku subdivision the experiment was unsuccessful. The soil on the banks of rivers, while seemingly unsuited to the growth of the imported variety, is well adapted for the native kind.
12	Magwe ...	Cultivated by Subdivisional and Township Officers and the Superintendent of the Magwe Jail.	In Taungdwingyi about one-fourth of the cobs attained the size of the seed supplied. The maize is said to be grown more for the leaves than for the grain itself. The leaves obtained from the American quality are reported to be larger, thinner, and smoother and superior to the leaves obtained from the indigenous plant. In Yenangyaung and Natmauk the experiment failed owing to late sowings. The experiment made by the Superintendent of the Jail was fairly successful. The cobs in size and quality were as good as those supplied.
13	Mandalay ...	Cobs sent for distribution to Subdivisional Officers of Maymyo and Singu.	American maize did very well in the Maymyo subdivision, but the experiment in the Singu township failed owing to floods, which washed away young plants.
14	Katha ...	Sown in the Military Police and Jail gardens.	Results were very satisfactory. The crop obtained from the Military Police garden was a good one. In the Jail garden the yield was about 300 cobs for three cobs sown. The cobs, though not quite large, were, however, full-seeded.
15	Ruby Mines ...	Seeds supplied for experiment in the Tagaung and Twinngè townships.	American maize does not appear to do well in this district. Though the seed germinated, the produce was poor and there was a distinct deterioration in the size of the seed produced compared with that sown.
16	Shwebo ...	Planted by the Deputy Commissioner at the district headquarters, by the Township Officer of the place in Kambalu, and by the villagers on the Mu river.	The experiment was a complete failure throughout the district owing (1) in Shwebo to want of rain and (2) in Kambalu and along the Mu to the unexpectedly high rise of the river, which washed away the plants.

STATEMENT V.—*Experimental cultivation—American Maize*—concluded.

No.	District.	Particulars regarding experiment.	Result of experiment.
17	Sagaing ...	Planted in all three subdivisions of the district.	The experiment in the Sagaing and Ava subdivisions proved a failure owing to heavy rain in the first case and in the other to unusually high floods which destroyed all the plants. In the Myinmu subdivision the experiment was a decided success. The plants grew 8 feet 8 inches in height and the cobs obtained were 1 foot 3 inches in length containing about 400 grains each.
18	Lower Chindwin ...	Cultivated by the thugyis of the Pale and Budalin subdivisions.	The result of the experiments was favourable; in two instances very good crops were obtained. Three cobs of maize planted in Nyaungbyubin village returned 300 cobs, while 10 viss were obtained from four cobs at Kyadet.
19	Upper Chindwin ...	Experiment conducted by the Subdivisional Officer and by the Superintendent of the Kindat Jail.	The experiment failed owing to excessive rain.
20	Myingyan ...	.....	Failure in every case throughout the district.

STATEMENT VI.—*Experimental cultivation—Tobacco.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		LOWER BURMA.	
1	Sandoway ...	Seeds distributed to thugyis through the Township Officers.	Experiment entirely failed. No reason for this is given.
2	Amherst ...	Distributed to Township Officers, thugyis, and cultivators.	Failed. Seed received too late. In one case over a viss of tobacco leaf (Havannah) was obtained.
3	Tavoy ...	Seed distributed to Township Officers and circle thugyis.	The experiment was a failure in Thayetchaung, while in Laungôn the produce was about 50 lbs. and in Nabulè about 2 lbs. The people are ignorant of the methods of this kind of cultivation and require instruction in planting and curing.
4	Mergui ...	.....	Not planted. Seed said to have been received too late.
5	Salween ...	Planted in October and gathered in February.	About 1¾ viss of tobacco was obtained at Kadaungti. Its flavour is stronger than that of the native tobacco.
6	Thayetmyo ...	Experiment conducted in the Minhla subdivision.	Failed owing to heavy falls of dew.
		UPPER BURMA.	
7	Pakôkku ...	Cutivated in parts of the Pakôkku subdivision.	Cultivation of tobacco in the Yesagyo township appears successful. The leaves (Havannah) were smaller in size than that of the native tobacco.
8	Magwe ...	Distributed to cultivators through the Subdivisional Officers of Magwe and Taungdwingyi.	Tobacco grown in Magwe germinated, but withered away when still young. At Taungdwingyi the seeds germinated, but the plants being stunted most of them died; some, however, grew fairly well. Failure is attributable to late sowings.
9	Mandalay ...	.....	Not planted; through an oversight the seeds were not distributed.
10	Shwebo ...	.....	Not planted.
11	Sagaing ...	Distributed to thugyis and cultivators through the Settlement Officer, Sagaing, and the Subdivisional Officers of Sagaing, Ava, and Myinmu.	Failed in the Sagaing and Myinmu subdivisions owing to late planting. At Myotha the cultivators obtained a fair crop and the flavour of the tobacco is said to be superior to that of native growth.
12	Lower Chindwin ...	Seeds distributed among cultivators who experimented with them.	Failed entirely except in one instance, in which ½ of an ounce of seed sown yielded 16 lbs. of tobacco. The failure is apparently due to the seed having been sown too late in the season.
13	Myingyan ...	.....	Failed.

STATEMENT VII.—*Experimental cultivation—English vegetables seeds.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA.	
1	Pakôkku ...	Cultivated by the Superintendent of the Jail in the Jail gardens.	Failed owing to the sandy nature of the soil.
2	Mandalay ...	Planted by cultivators in the Maymyo, Singu, and Amarapura subdivisions.	In Maymyo the experiments came to nothing; in Amarapura owing to the unusually late floods, which washed away the young plants much to the disappointment of cultivators. In Singu the experiment at first promised well, but after they were transplanted celery, asparagus, and onions began to wither rapidly. Peas did not thrive very well, but beans, lettuce, and kholrabi matured to perfection. In Maymo the sowings were late and the experiment was consequently unsuccessful.
3	Bhamo ...	.....	The experiment was fairly successful, though little or no interest was taken by the Myoôks to whom the seeds were distributed.
4	Katha ...	The seeds were planted in the Jail garden.	The experiment was on the whole a success, though owing to the difficulty in regard to watering it was not quite as successful as it might have been.
5	Shwebo ...	Sown by the Subdivisional Officer, Shwebo.	Result of experiments very poor, due to numerous changes of officers in charge. Knol-khol, lettuce, and beet-root successful; cabbage, cauliflower, radish, and carrots fair; turnips, asparagus, beans, peas, strawberry, raspberry, and onions failed.
6	Sagaing ...	Seeds were distributed to four persons.	These experiments were very successful, while in one case the crop was a total failure owing to abnormally heavy rain.
7	Lower Chindwin ...	Cultivated by thugyis and others.	Cabbage, broccoli, and beet-root poor. Cauliflower attacked by insects and failed. Onions cultivated at Ngakôn did very well; weight of bulb varied from 1 to 1½ pound. Beans and radish were very good and most successful. Asparagus and water-melon failed. Peas, turnips, celery, carrots, lettuce, and kholrabi turned out fairly well. Largest turnip weighed ½ lb. and largest kholrabi 1½ lbs. Tomatoes did very well; largest specimen weighed ¾ lb. Experiments on the whole were favourable.
8	Upper Chindwin ...	Grown in the Kindat Jail ...	The following vegetable seeds gave good results,—Lettuce, beans, turnips, and knol-khol. Broccoli was only a partial success, while carrots, water-melons, celery, asparagus, and onions were failures.
9	Chin Hills (Haka)...	Experiments conducted chiefly in Haka.	Cabbages grew well, but suffered much from the ravages of insects. Brussels sprouts, cauliflower, and other garden vegetables can be successfully grown. The crop of cauliflower in Haka was specially heavy. Radish, carrots, turnips, beet-root, and kholrabi all did well both in black and shaly soil. Tomatoes were not a success. Peas and beans did very well. Celery is a difficult vegetable to grow and, though most successful last year, failed this year. Seeds of various sorts were distributed among the Chins and have been fairly successful.

STATEMENT VIII.—*Agricultural Shows. Prize List.*

Nature of exhibits.	Akyab. First.	Akyab. Second.	Akyab. Third.	Akyab. Honorary mention.	Thônzè. First.	Thônzè. Second.	Thônzè. Third.	Thônzè. Fourth.	Thônzè. Honorary mention.	Henzada. First.	Henzada. Second.	Henzada. Third.	Moulmein. First.	Moulmein. Second.	Myinmu. First.	Myinmu. Second.	Myinmu. Third.	Myinmu. Fourth.	Myinmu. Honorary mention.	Kyaungdawya. First.	Kyaungdawya. Second.	Kyaungdawya. Third.	Pyawbwè. First.	Pyawbwè. Second.	Pyawbwè. Honorary mention.	Remarks.
	PRIZES.																									
	Rs.	Rs.	Rs.	No.	Rs.	Rs.	Rs.	Rs.	No.	Rs.	Rs.	Rs.	Rs. A.	Rs. A.	Rs.	Rs.	Rs.	Rs.	No.	Rs.	Rs.	Rs.	Rs.	Rs.	No.	
CLASS (i).—*Cattle.*																										
1. Best pair buffaloes ...	...	...	...	...	...	...	...	...	...	15	10	...	...	...	20	10	5	3	...	20	10	...	...	...	...	*Note.*—There were no exhibits under the following heads—
2. Best pair plough bullocks ...	20	10	...	1	20	10	10	10	...	10	10	5	...	15 0	20	10	5	3	...	20	10	...	15	10	1	
3. Best pair draught bullocks ...	...	...	...	...	...	...	...	...	...				5 0	...	20	10	5	3	1	20	10	10	15	10	...	
4. Best pair bull buffalo	...	...	...	...	15	10	...	...	...	...	...	...	...	10 0	...	...	...	...	...	...	...	...	...	...	...	CLASS (iii).
5. Best pair cow buffalo	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15	...	...	
6. Best bullock (cart or other) ...	...	...	...	...	10	5	5	...	...	...	...	...	...	...	10	5	3	2	...	...	...	...	...	...	...	
7. Best bull	15	...	...	...	15	5	5	...	...	5	...	...	5 0	...	...	...	...	...	1	20	10	...	15	5	...	Goats.
8. Best milch-cow	...	...	...	...	15	...	...	...	...	10	7	...	...	10 0	10	...	...	...	...	20	10	...	15	5	...	Ram (sheep).
9. Best cow and calf	...	...	...	...	...	...	...	...	...	...	...	...	...	10 0	...	...	...	...	...	...	...	...	...	...	...	Ewe (sheep).
CLASS (ii).—*Ponies.*																										CLASS (iv).
10. Best half-bred stallion	...	...	...	...	20	5	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Brood of ducklings.
11. Best Burman stallion	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	20	10	...	...	...	...	
12. Best Burman or Shan gelding ...	...	...	...	...	10	...	...	...	...	10	10	...	...	...	10	5	3	...	...	20	10	...	15	...	...	CLASS (xii).
13. Best Burman brood mare and foal...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	15	10	...	
14. Best Burman foal	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	Tank.
CLASS (iii).—*Other animals.*																										Water-lift.
15. Best sow with litter	...	...	...	...	5	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	
16. Best boar	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
17. Best English pigs	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	
CLASS (iv).—*Poultry.*																										
18. Best turkeys	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	
19. Best flock of geese	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20. Best pair geese	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
21. Best pair fowls	...	...	...	...	...	...	...	...	...	3	3	...	5 0	...	...	...	...	...	...	...	...	...	...	...	...	
22. Best cock or hen	...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
23. Best duck or drake	...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
24. Best collection of fowls	...	...	...	...	...	...	...	...	...	...	...	...	5 0	...	...	...	...	...	...	...	...	...	...	...	...	
25. Best collection of poultry ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	
26. Best brood of chickens	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	5	5	5	...	...	
CLASS (v).—*Staple and other foods.*																										
27. Best sample rice (assorted) ..	5	...	...	...	5	...	...	...	1	...	...	...	...	...	10	5	...	...	...	...	...	...	...	...	...	
28. Best sample paddy (assorted) ...	5	...	...	1						10	5	...	...	...	10	5	...	...	...	...	...	...	...	...	...	
29. Best kyaukkyi paddy	...	...	...	...	...	...	...	...	...	...	...	...	10 0	...	...	...	...	...	...	...	...	...	...	...	...	
30. Best yahaing	...	...	...	...	...	...	...	...	...	...	...	...	10 0	...	...	...	...	...	...	...	...	...	...	...	...	

31. Best shangale ...	...	...	...	...	...	...	...	...	...	...	...	...	10 0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
32. Best wheat ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	
33. Best Indian-corn (pyaungbu) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	
33a. Best millet (pyaung) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	5	...	...	...	...	...	...	...	...	...	...	
34. Best peas ...	...	...	...	...	5	...	...	...	1	...	...	...	...	...	10	3	...	...	...	...	...	...	...	...	...	...	
35. Best gram ...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
36. Best kyaungtaga sugar ...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
37. Best chillies ...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
38. Best til-seed (sessamum) ...	...	...	...	...	...	...	...	...	...	...	...	...	2 8	2 8	10	...	...	...	...	...	...	...	...	...	...	...	
CLASS (vi).—*Fruits.*																													
39. Best bunch of plantains ...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	3	2	...	...	...	...	...	...	...	...	...	...	
40. Best oranges ...	...	...	...	...	...	...	...	...	...	...	...	...	10 0	5 0	...	...	...	...	...	...	...	...	...	...	...	...	
41. Best cluster of cocoanuts ...	...	...	...	...	5	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
42. Best cluster of betel-nuts ...	...	...	...	...	...	...	...	...	...	...	...	...	...	5 0	...	...	...	...	...	...	...	...	...	...	...	...	
43. Best collection of garden fruits ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	5	...	...	...	...	...	
CLASS (vii).—*Vegetables.*																													
44. Best pumpkins and gourds ...	...	...	...	...	...	...	...	...	...	2	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
45. Best yams and sweet potatoes ...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
46. Best tomatoes and brinjals ...	...	...	...	...	...	...	...	...	...	5	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
47. Best red onions ...	...	...	...	...	...	...	...	...	...	...	...	...	10 0	...	...	...	...	...	...	...	...	...	...	...	...	...	
48. Best collection of country vegetables ...	...	...	...	...	...	...	...	...	...	...	...	...	10 0	...	5	3	...	...	...	...	...	...	...	...	...	...	
49. Best collection of English vegetables ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	
CLASS (viii).—*Other agricultural produce.*																													
50. Best fruit garden ...	...	...	...	...	20	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
51. Best vegetable garden ...	...	...	...	...	20	10	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	15	...	...	...	
52. Best tobacco leaf (cured) ...	...	...	...	...	5	...	...	...	...	10	10	...	...	...	10	5	...	...	...	...	...	...	...	...	...	...	
53. Best nutmeg (locally grown) ...	...	...	...	...	...	...	...	...	...	...	...	...	10 0	...	...	...	...	...	...	...	...	...	...	...	...	...	
54. Best cloves (locally grown) ...	...	...	...	...	...	...	...	...	...	...	...	...	5 0	...	...	...	...	...	...	...	...	...	...	...	...	...	
55. Best pepper (locally grown) ...	...	...	...	...	...	...	...	...	...	...	...	...	5 0	...	...	...	...	...	...	...	...	...	...	...	...	...	
56. Best exhibit of produce raised from Government seeds.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	
CLASS (ix).—*Raw materials.*																													
57. Best uncleaned cotton ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	
CLASS (x).—*Forest produce.*																													
Nil.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
CLASS (xi).—*Agricultural implements, &c.*																													
58. Best set of agricultural implements	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	5	...	...	1	10	5	5	...	...	...	...	
59. Best plough or harrow ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	
60. Best Burman bullock cart ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	5	3	...	...	10	10	...	...	...	...	...	
61. Best straw stack ...	...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
62. Best cattle-shed (with trough) ...	...	...	...	...	10	5	...	...	1	...	...	...	...	...	...	...	...	...	...	15	...	...	...	...	...	...	
CLASS (xii).—*Irrigation works, &c.*																													
63. Best well, 25 feet or more deep ...	...	...	...	...	30	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
64. Best earth-bund for storing water ...	...	...	...	...	20	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
CLASS (xiii).—*Miscellaneous.*																													
65. Best mats (thinbyu) ...	...	...	...	...	5	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
66. Best silver-work ...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
67. Best country made pottery ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	5	...	...	...	...	...	...	...	...	...	...	
Total prizes ...	50	10	...	2	260	70	25	10	14	101	62	7	102 8	57 8	240	83	24	11	6	195	95	20	135	40	1	= Rs. 1,598 0 0	
Contingencies ...	...				...*					26-9			140		328†					...			...			= Rs. 494 9 0	
GRAND TOTAL ...	60+0=60				365+0=365					170+26-9=196-9			160+140=300		358+328=686					310+0=310			175+0=175			= Rs. 2,092 9 0	

* Paid from District cess funds.
† Partly met (Rs. 178) from private subscriptions.

STATEMENT IX.—*Annual Famine Statement C for Burma for the year 1895-96.*

Division.	District.	Population.	Maximum number of persons for whom relief works may be required.	Number of persons provided for by relief works daily for three months.			Description without details of the general character and utility of the works under each head and of the prospects of their completion either within or soon after the period of scarcity.		
				Large works.	Small works. Simple works.	Small works. Work near villages.	Character.	Utility.	Completion.
1	2	3	4	5	6	7	8	9	10
Arakan ...	Sandoway	78,425	3,000	6,000	...	...	Roads	Certified by Deputy Commissioner ...	Can be completed within the period of scarcity.
Pegu ...	Thayrawaddy	374,454	4,000	7,000	14,000	...	Roads, irrigation and miscellaneous works.	Certified by Executive Engineer and Deputy Commissioner.	Might be finished within six months.
	Prome	360,252	35,000	6,000	12,000	...	Roads and irrigation works	Certified by Executive Engineer ...	Can be completed within the period of scarcity.
Northern ...	Mandalay	374,060	15,000	45,000	5,000	...	Nine roads and three irrigation works ...	Recommended by Public Works Department.	Might be finished within period of scarcity.
	Bhamo	93,260	5,000	37,000	6,000	...	Roads	Certified by Deputy Commissioner ...	Can be completed within the period of scarcity.
	Katha	139,626	5,000	23,000	4,000	...	Roads and irrigation works	Certified by Deputy Commissioner and Executive Engineer.	
	Ruby Mines	34,062	1,000	8,000	1,000	...	Ditto ditto	Certified by Deputy Commissioner ...	None of these works are likely to be finished during the period of scarcity, except the minor ones.
Central ...	Shwebo	138,230	30,000	25,000	6,000	...	Roads, tanks, bund, embankments, and wells.	Ditto ditto ...	Might be finished within six months.
	Ye-u subdivision ...	92,549	15,000	12,000	3,000	...	Roads and irrigation works	Certified by Executive Engineer ...	
	Sagaing	247,136	20,000	38,000	2,000	...	Roads and irrigation works, comprising construction and repairs to tanks and canals.	Ditto ditto ...	Can be finished within the period of scarcity.
	Lower Chindwin ...	233,316	30,000	51,000	13,000	...	Roads and irrigation works	Certified by Executive Engineer and Deputy Commissioner.	
	Upper Chindwin ...	111,216	7,000	10,000	4,000	...	Roads	Certified by Deputy Commissioner ...	
Southern ...	Thayetmyo	250,161	13,000	22,000	4,000	...	Roads and irrigation works	Certified by Executive Engineer ...	
	Pakôkku	315,827	30,000	55,000	14,000	...	Ditto ditto	Certified by Deputy Commissioner ...	
	Minbu	212,401	15,000	24,000	5,000	...	Ditto ditto	Certified by Executive Engineer ...	
	Magwè	219,190	20,000	9,000	11,000	...	Ditto ditto	Ditto ditto ...	
Eastern ...	Meiktila	306,650	20,000	33,000	6,600	...	Ditto ditto	Certified by Executive Engineer and Deputy Commissioner.	Can be completed within or soon after the period of scarcity.
	Yamèthin	217,011	20,000	28,000	12,000	..	Ditto ditto	Ditto ditto ...	
	Myingyan	351,481	10,000	11,000	8,000	1,000	Ditto ditto	Certified by Deputy Commissioner ...	Can be completed within the period of scarcity.
	Total ...	4,022,237	298,000	450,000	130,000	1,000			

G. B. C. P. O.—No. 6103, D., L. R. & A., 23-11-95—235.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1895-96.

RANGOON: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, BURMA. JANUARY 1897.

[Price,—Re. 1-0-0.]

TABLE OF CONTENTS.

REPORT ON THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BURMA, FOR THE YEAR 1895-96.

	Para.	Page.
SECTION I.		
Subjects on land records and survey schools included in report	1	1
SECTION II.		
ANALYSIS OF DISTRICTS WITH REFERENCE TO SECURITY AGAINST FAMINE.		
Famine Code	2	1
PREPARATION OF FAMINE ANALYSES.		
Famine analyses received from districts	3	1
LOWER BURMA.		
Analysis received during the year.		
Sandoway district	4	3
UPPER BURMA.		
Analysis received during the year.		
Bhamo district	5	3
Necessity for further revision of district analyses.		
Further revision necessary	6	3
Rainfall and harvest	7	ib.
The food-supply of Upper Burma	8	ib.
SECTION III.		
SYSTEM OF COLLECTION OF REVENUE IN PRECARIOUS TRACTS.		
No change in collection of revenue...	9	5
SECTION IV.		
FODDER RESERVES AND ARBORICULTURE.		
Grazing-grounds in Lower Burma	10	5
SECTION V.		
AGRICULTURAL EXPERIMENTS AND ENQUIRIES AND EDUCATION.		
Distribution of seed in Burma	11	5
American maize	12	6
Jute	13	ib.
Virginia and Havana tobacco	14	ib.
Vegetable seeds (Messrs. Sutton and Sons)	15	ib.
Hemp	16	ib.
Other experiments	17	ib.
Experimental cultivation in the Southern Shan States	18	ib.
Tavoy Sunn hemp	19	7
Experimental cultivation without Government aid. Kyauktaga, Pegu district	20	ib.
Agricultural shows	21	ib.
Letpadan	ib.	ib.
Minbu	ib.	ib.
Henzada	ib.	ib.
Moulmein	ib.	ib.
Myinmu-Sagaing	ib.	8
Experiments with Agricultural Implements.		
Cawnpore chain pump	22	8
Sultan water-lifts	23	ib.
Japanese rice-mills	24	ib.
Agricultural Education.		
Remarks on agricultural education	25	8
Collection of Economic Products of Burma for the Indian Museum, Calcutta, and the Imperial Institute of the United Kingdom, London.		
Specimens of economic products	26	9

SECTION VI.

Cattle-breeding and Veterinary Establishments.

	Para.	Page.
Subjects dealt with in Report of Civil Veterinary Department	27	9

SECTION VII.

Agricultural and Fiscal Statistics.

General	28	9
Rainfall statistics	29	ib.
Crop reports	30	ib.
Crop statistics	31	10
Monthly food-supply rates and fortnightly statements and retail prices	32	ib.

SECTION VIII.

Trade and Trade Statistics.

The trans-frontier trade	33	10
Internal trade registration	34	ib.
External trade registration	35	ib.
System of registration	36	ib.
Cost of registration	37	ib.
Rice-crop estimates	38	ib.

APPENDICES.

	Page.
Appendix A.—Report on experimental cultivation in the Southern Shan States for the year 1895-96	iii.
Appendix B.—Extract from report of Mr. J. Mylne on the progress made on the land granted him at Kyauktaga, Pegu district	xiii.
Appendix C.—Extracts from the reports on the agricultural shows held during the year 1895-96	xiv.
Statement No. IV.—Distribution list of seed obtained for experimental cultivation during the year 1895-96	xviii.
Statement No. V.—Description of seeds received, together with the cost of consignment and of distribution during 1895-96	xix.
Statement No. VI.—Experimental cultivation—American maize	ib.
Statement No. VII.—Experimental cultivation—Tobacco	xxi.
Statement No. VIII.—Experimental cultivation—English vegetable seeds	xxii.
Statement No. IX.—Experimental cultivation—Jute	xxiii.
Statement No. X.—Experimental cultivation—Hemp	xxiv.
Statement No. XI.—Experimental cultivation—Gram	ib.
Statement No. XII.—Experimental cultivation—Wheat	xxv.
Statement No. XIII.—Experimental cultivation—Potatoes	ib.
Statement No. XIV.—Agricultural shows—Price list	xxvi.
Statement No. XV.—Annual Famine Statement G for Burma for the year 1896-97 ...	xxviii.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1895-96.

SECTION I.

PARAGRAPHS relating to Land Records and Survey Schools have been included in the Revenue Administration Report.

Revised forms for the annual report on supplementary survey and survey schools were prescribed during the year. The form of the departmental report needs revision also.

SECTION II.

ANALYSIS OF DISTRICTS WITH REFERENCE TO SECURITY AGAINST FAMINE.

Famine Code.

2. During the year the Famine Code was finally revised, and is now being indexed. The Code, as revised, clearly lays down the duties of all officers in ordinary times as well as in times of famine or scarcity, and contains full instructions regarding the necessity of watching the agricultural condition of precarious tracts. By section 3 of the Code the analysis of a district with reference to security against famine, after having been once prepared by the Deputy Commissioner, shall, under ordinary circumstances, be revised every three years, but where the conditions of a district are rapidly changing, a revised analysis must be submitted annually.

PREPARATION OF FAMINE ANALYSES.

3. Analyses have now been received from all the 20 districts mentioned in paragraph 2 of last year's departmental report, and it has not been found necessary to make alterations in the analyses submitted for 18 districts last year. Each village is classed and shown in the map as secure, secure in ordinary years, or insecure; and the table below will give a rough idea of the number of villages in each class throughout Burma. The only district in Upper Burma for which no analysis has as yet been drawn up is the new district of Myitkyina on the borders of the Chinese frontier. An analysis of that portion of the district for which information is obtainable has been called for.

Serial No.	Name of district.	Class A (Secure).			Class B (Partially secure).			Class C (Insecure).			Average rainfall of the past three years at the head-quarters of each district.	Remarks.
		Number of villages.	Population.	Total area in square miles.	Number of villages.	Population.	Total area in square miles.	Number of villages.	Population.	Total area in square miles.		
1	2	3	4	5	6	7	8	9	10	11	12	13
	Upper Burma—											
1	Mandalay	157	114,809	357	97	30,643	886	110	45,793	944	44·87	
2	Bhamo	108	21,953	198	145	18,888	528	...	...	...	80·60	
3	Katha	390	36,665	1,310	1,169	102,961	5,390	...	...	...	67·57	
4	Ruby Mines	236	37,146	2,612	177	27,487	2,124	...	...	...	101·19	
5	Shwebo	...	...	...	133	32,939	599	191	96,264	2,255	34·40	
6	Ye-u subdivision, Shwebo... ...	...	...	...	147	18,858	3,000	507	101,142	2,000	33·47	
7	Sagaing	270	128,629	400	239	67,355	679	165	55,015	800	35·26	
8	Lower Chindwin	10	9,255	...	130	112,256	(a)	110	111,805	...	31·18	
9	Upper Chindwin	356	31,602	(a)	671	61,810	(a)	39	15,773	(a)	78·27	(a) Figures not ava il- able.
10	Pakôkku	381	113,505	1,700	526	104,900	2,420	448	72,504	2,180	31·92	
11	Minbu	165	68,708	(a)	168	45,481	(a)	28	5,459	(a)	36·99	
12	Magwe	31	11,819	166	722	207,097	4,067	...	...	...	35·70	
13	Thayetmyo	60	24,000	280	285	66,577	1,991	447	98,029	2,490	40·22	
14	Kyauksè	371	117,210	440	26	3,842	485	25	5,570	125	30·02	
15	Meiktila	...	...	...	96	26,573	200	965	179,391	2,800	34·00	
16	Yamèthin	82	12,745	60	1,039	183,105	3,200	7	14,000	4	39·52	
17	Myingyan	...	...	...	183	86,988	934	688	227,264	2,803	26·07	
	Total for Upper Burma ...	2,617	728,046	...	5,953	1,197,760	...	3,730	1,028,009	...	...	
	Lower Burma—											
1	Sandoway	219	27,396	1,387	348	48,498	2,456	...	...	...	191·64	
2	Tharrawaddy	1,246	298,149	1,732	243	49,305	282	...	...	...	82·76	
3	Prome	785	236,069	665	406	76,762	600	318	41,885	1,482	44·20	
	Total for Lower Burma ...	2,250	561,614	3,784	997	174,565	3,338	318	41,885	1,482	...	
	Grand Total for Upper and Lower Burma.	4,867	1,289,660	...	6,950	1,372,325	...	4,048	1,069,894	...	...	

LOWER BURMA.

Analysis received during the year.

Sandoway district.

4. In Sandoway the total cultivated area is 49,438 acres and the total population 75,894; of a total of 567 villages, 348 with a population of 48,498 and a gross area of 2,456 square miles are shown as secure in ordinary years, but through want of rain and drought in high-lying villages or inundation of salt-water in the low-lying villages liable to become insecure. No villages are actually shown as insecure, while 219 with a population of 27,396 are shown as secure.

UPPER BURMA.

Analysis received during the year.

Bhamo district.

5. In Bhamo 108 villages with a gross area of 198 square miles and a population of 21,953 are classed as secure, while 145 with a population of 18,888 and a gross area of 528 square miles are classed as secure in ordinary years. Of these latter villages 48 villages are liable to damage from floods and insects, but are otherwise secure; 70 villages with a population of 9,175 may become insecure through cattle-disease or failure of rain, and part could not be supplied in time of scarcity by private traders. These villages could, however, exist on their own resources for a year. The remaining 27 villages are easily accessible by water and the carriage of supplies would be easy.

Necessity for further revision of district analyses.

6. The partial drought in the dry zone of Upper Burma last year and the consequent remission of part of the revenue may in a slight degree be used as a guide to the revision of analyses. To consider the effects of one year would, however, be injudicious, as the rainfall is not only scanty but capricious and local. As pointed out in paragraph 19 of the departmental report of last year, the incorrectness of the Yamèthin analysis has become evident. The remissions of revenue in Yamèthin amounted to nearly a lakh. The Deputy Commissioner has been asked to revise the analysis as there can be no doubt that the district is more insecure than is represented. The rest of the remissions, about five lakhs of rupees, were given, nearly half in Myingyan and Meiktila and the rest over the other districts in the dry zone. In Magwe alone of all districts within the dry zone were remissions found to be unnecessary. The whole district, like Myingyan, is practically classed as insecure. The crop, however, even in the paddy plain of Taungdwingyi, is entirely dependent on the rainfall.

Another point in which the famine analyses want revising is the question of food-stocks of cultivators and others. In Sagaing and the Ruby Mines, more specially in Tagaung township and in the Upper Chindwin, groups of villages are classed as secure in ordinary years, but the cultivators and others are said to be able *always* to purchase food imported. If cultivators who raise their own food-grains are able to purchase imported grain always, the tract cannot but be regarded as secure.

In Lower Burma the drought affected Prome and Tharrawaddy, two of the three districts for which analyses are prepared.

7. *(1) Rainfall and harvest; (2) Prices.*

These subjects have been dealt with in the Revenue Administration Report.

The food-supply of Upper Burma.

8. The statement given below shows the quantity of the various food-grains and other provisions which were imported and exported by Upper Burma during the year:—

Statement showing the direction of trade in the principal food-grains, pulse, and provisions.

Year.	Description.	Brought into Upper Burma			Taken out of Upper Burma			Balance		Net total of food-grains, &c., brought into Upper Burma.	Remarks.
		From Lower Burma.	From foreign countries.	Total.	To Lower Burma.	To foreign countries.	Total.	Brought into Upper Burma.	Taken out of Upper Burma.		
		Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	
1894-95.	Wheat	72,249	224	72,473	8,594	1,383	9,977	62,496	...	...	
	Paddy	5,07,773	3,278	5,11,051	4,45,020	2,068	4,47,088	63,963	...	...	
	Rice	4,91,476	20,451	5,11,927	23,790	986	24,776	4,87,151	...	...	
	Jowar and bajra ...	...	...	...	222	...	222	...	222	...	
	Gram and pulse ...	24,371	478	24,849	6,64,161	1,475	6,65,636	...	6,40,787	...	
	Other grains and pulses	16,051	130	16,181	3,426	...	3,426	12,755	...	...	Maize, barley, and oats.
	Ghi	15,672	20	15,692	122	597	719	14,973	...	...	
	Dried fruits, vegetables and nuts.	69,412	35,520	1,04,932	2,11,124	1,800	2,12,924	...	1,07,992	...	Onions, garlic, potatoes, dates, tamarind, &c.
	Other provisions ...	7,26,293	1,11,855	8,38,148	39,091	73,597	1,12,688	7,25,460	...	...	Ngapi, salted or dried fish, flour, biscuits, butter, condensed milk, pickled tea, oilman stores, &c.
	Total ...	19,23,297	1,71,956	20,95,253	13,95,550	81,906	14,77,456	13,66,798	7,49,001	6,17,797	
1895-96.	Wheat	86,257	...	86,257	15,344	9,956	25,300	60,957	...	...	
	Paddy	4,99,255	4,632	5,03,887	5,67,638	634	5,68,272	...	64,385	...	
	Rice	8,12,772	27,559	8,40,331	2,183	290	2,473	8,37,858	...	...	
	Jowar and bajra ...	...	...	...	...	...	...	...	...	...	
	Gram and pulse ...	28,604	408	29,012	5,41,558	572	5,42,130	...	5,13,118	...	
	Other grains and pulses	9,015	21	9,036	4,645	...	4,645	4,391	...	...	Maize, barley, and millet.
	Ghi	16,105	2	16,107	13	1,153	1,166	14,941	...	...	
	Dried fruits, vegetables and nuts.	80,801	49,983	1,30,784	2,58,094	1,667	2,59,761	...	1,28,977	...	Onions garlic, potatoes, dates, tamarind, &c.
	Other provisions ...	7,22,186	1,10,559	8,32,745	47,203	68,172	1,15,375	7,17,370	...	...	Ngapi, salted or dried fish, flour, biscuits, butter, condensed milk, pickled tea, sardines, bacon, hams, oilman stores, &c.
	Total ...	22,54,995	1,93,164	24,48,159	14,36,678	82,444	15,19,122	16,35,517	7,06,480	9,29,037	
	Increase or decrease...	+ 3,31,698	+ 21,208	+ 3,52,906	+ 41,128	+ 538	+ 41,666	+ 2,68,719	− 42,521	+ 3,11,240	

The figures show the extent to which Upper Burma was dependent on Lower Burma and the adjoining Shan States for its supply of food-grains, &c. It will be seen from a comparison of the figures for the two periods 1894-95 and 1895-96 that the demand for outside aid increased by 3,11,240 maunds during the latter period. This increase appears almost entirely under the head "Rice imported from Lower Burma," and the enhanced importations are the result of the scarcity of rain and the consequent failure of crops on unirrigated land in Upper Burma. The surplus paddy of the 1894-95 crop available for exportation found its way to Lower Burma during the first quarter of the year. There is a marked falling off in the quantity of gram and pulse imported into Lower Burma, due to the same reason as that stated in the case of rice.

SECTION III.

SYSTEM OF COLLECTION OF REVENUE IN PRECARIOUS TRACTS.

9. No change has been made during the year in the system of collection of revenue. Where the area, over which the failure of crops is felt, is of large extent, the reduction of the *thathameda* rate in Upper Burma sufficiently meets the necessities of the case. Proposed changes in the system of assessment of revenue in Upper Burma have been under discussion during the year.

The method of entering as fallow and unassessed lands on which the crops had entirely failed was tried in the Kyauksè district, but was found not to be a success in practice. The chief obstacles were the difficulty of saying when a crop had entirely failed and the extra trouble that was caused by cultivators still continuing to apply for remission to the Revenue Officer as before.

SECTION IV.

FODDER RESERVES AND ARBORICULTURE.

10. The subject of grazing-grounds in Lower Burma is dealt with in the Revenue Administration Report.

The officer deputed to make enquiries into the fuel reserves in Thôngwa submitted his report; but the consideration of the reserves proposed has been left to the Divisional Forest Officer. The special officer will continue his enquiries in the Bassein and Myaungmya districts and, where possible, select reserves that will be available for fodder and fuel.

The Deputy Commissioner, Thatôn, has received the report of the Settlement Officer on the southern portion of the district.

SECTION V.

AGRICULTURAL EXPERIMENTS AND ENQUIRIES AND EDUCATION.

Distribution of seed in Burma.

11. Statements IV and V show the seed obtained and distributed for experimental cultivation in Burma. The seed was distributed to Deputy Commissioners, who handed it over to cultivators. No special attention is, as a rule, given to the plants or to the selection of soil for the experiment, but the seed is sown as the Burman sows his own seed, and it is left to chance whether there is any result or not. In Lower Burma seed distribution is unnecessary, as experiments in garden cultivation are widely made by the Burmans themselves.

The method of seed distribution has not yet evoked any great results in Upper Burma, and, unless special attention can be given to the experiment by the cultivator and by the local officials, success is not to be hoped for.

The failure of many of the experiments may be attributed partly to the deterioration of the seed before it reaches its destination and partly to the haphazard way in which the selection of soil for planting is made.

During the year Rs. 836-1-3 were spent on the purchase and distribution of seed.

American maize.

12. In Lower Burma the only good results reported are from the neighbourhood of Toungoo. The white variety did very well on the level soil near the town, but was not successful in the hills. In Upper Burma the scanty rainfall of last year interfered with the experiments. In two townships in Pakôkku, in Kindat, and Paungbyin subdivisions, Upper Chindwin, and on low moist soil in Budalin subdivision, Lower Chindwin, good results were obtained. Elsewhere the attempts were failures, except where a plentiful supply of water was easily obtained. Maize seeds will not be distributed in future.

Jute.

13. Jute seed was obtained from the Botanical Gardens, Sibpore, and distributed to six districts in Lower Burma. The experiments were not a success in any district. In Tharrawaddy, where it has been tried before in former years, the failure was attributed to the condition of the seed. In Myaungmya and Bassein the villagers were ignorant of the cultivation; in Amherst seed was obtained from a few plants and a fresh experiment will be made at the beginning of the rains; in Tavoy the heavy rainfall ruined the experiment, and in Mergui the Deputy Commissioner failed to find any one willing to make the experiment; in Shwebo district, Upper Burma, the experiment was a failure owing to want of irrigation.

Jute seed was also obtained by the Superintendent of the Ma-ubin Jail from Dacca. The experiment made was very successful and 9½ maunds were obtained from less than an acre of land. His report was circulated to all District Officers in Lower Burma. At present the amount and the cost of labour involved in the cultivation is an obstacle to its introduction among Burmese cultivators in the more fertile districts.

Virginia and Havana tobacco.

14. Tobacco seed was distributed to four districts in Lower Burma and to nine districts in Upper Burma. In Lower Burma the cultivation was successful only in one township of the Thatôn district. In Upper Burma the results were *nil* in most districts and the experiments only partially successful in the Wundwin township, Meiktila, and in one part of Pakôkku, where it was planted on rich alluvial soil. No experiments were made in curing the tobacco, and, although no doubt tobacco can be grown successfully either in the alluvial soil on the islands, or on richly manured soil in most parts of Burma, the experiments both in cultivation and in curing had best be left to private enterprise.

Vegetable seeds (Messrs. Sutton and Sons).

15. English vegetable seeds were distributed to 11 districts in Upper Burma and to the Political Officer, Chin Hills. The details of the cultivation are given in Statement VII of the Appendices. The experiments succeeded best in the Chin Hills, where it has been arranged in the ensuing year to entertain a gardener for the cultivation not only of vegetables, but also of fruit trees, and good results were obtained in the Ruby Mines, where the villagers are extending their cultivation; in other districts only a partial success was obtained.

Hemp.

16. Seeds were obtained from the Agri-Horticultural Society, Calcutta. The experiment was successful in Pegu; elsewhere from the reports received it would appear that the fault lay in the seed being old.

Other experiments.

17. Three maunds of Mandalay gram were sent to the Ruby Mines and resulted in an abundant crop of good quality. Sagaing wheat was sent to the Ruby Mines and the Chin Hills. The seed was sown somewhat late and, except in the Haka garden, was not a success. The Chins partially succeeded in the cultivation of potatoes and are anxious to continue.

Experimental cultivation in the Southern Shan States.

18. The report of Mr. Hildebrand, Superintendent of the Southern Shan States, is given *in extenso* in Appendix **A**. In the statements attached to the report are given the details of receipt and expenditure, and it is not unreasonable to hope that in a few years the garden will be entirely self-supporting. It was found that the work of hands permanently employed, who improved with

training, was better than the casual labour hitherto used and the staff of under-gardeners will be increased.

During the year the orchard was well attended to, and the whole area of 20 acres taken up for cultivation two years ago has now been planted, mainly with apple and pear trees. These, walnuts, peaches, and plums will no doubt be a success. The strawberries were a failure owing to want of irrigation. The raspberries have not fruited yet.

The history of the wheat cultivation is unfortunate, but in future such accidents can be guarded against, and there is every promise of success in future years.

The potato cultivation has no doubt made good headway, and, as with other products, the only obstacle in the way of its extension is the great distance from any market. Owing to Mr. Hildebrand's exertions the crop was sold at a reasonable price. The experiment of a cold-weather crop would have been a success but for the unusual severe frost in January and February. Other vegetables also suffered from the same cause and from the exceptionally hot weather in the following months.

The vegetable garden depends entirely on the limited demand in the station and its upkeep on the local subscriptions.

Tavoy Sunn hemp.

19. Sunn hemp is grown in the neighbourhood of salt-water in Tavoy as a second crop after the early paddy has been reaped. It is largely used for the making of fishermen's nets. At present the area under cultivation is small and the price is high. An experiment carried out by the Superintendent of the Moulmein Jail proved that 100 viss of hemp costing Rs. 69-14-0 landed in Moulmein would make 200 gunny bags priced at Rs. 30. In Tavoy the price for the best quality is Rs. 50 per 100 viss. Three pounds of the best fibre were sent to the Imperial Institute for inquiry as to its market value. The opinion of experts on the fibre was very favourable. The market value was said to be between £16 and £17 per ton, and, if better cleaned, the hemp could be sold for £2 to £3 per ton higher than the above price.

Experimental cultivation without Government aid. Kyauktaga, Pegu district.

20. Towards the end of the year 1895 a report was received from Mr. Mylne of the progress made in settling Behari cultivators on the land granted to him at Kyauktaga. The report shows that Mr. Mylne has spared neither money nor trouble in his endeavour to bring the scheme to a successful issue. An extract from the report will be found in Appendix **B**. The statements referred to have been omitted as the substance of them is given in the report. Lower Burma is at present largely supplied by Upper Burma with *kyantaga*.*

Agricultural shows.

21. Agricultural shows were held during the year at Letpadan, Tharrawaddy district, at Kyaungdawya, Minbu, at Myinmu, Sagaing, and at Moulmein and Henzada. The success of these shows usually depends on the amount of interest the District Officers take in them, and, where a Deputy Commissioner actively tries to interest others in the show, it seldom is a failure. A list of the prizes awarded at the various shows is given in Statement XIV of the Appendices.

Letpadan.—The show was a success, the number of the exhibits large, and the attendance good. The garden produce exhibited was good, but the most noticeable feature was the fine cattle exhibited.

Minbu.—This show also was a great success, not only in the exhibits of cattle, but also of ponies. The show of the latter was so fine that the Commissioner has suggested that the Government might buy a really good Burma stallion in another year.

Henzada.—This year special care was taken to ensure success and the attendance was large. The agricultural stock exhibited was remarkably fine, and among the miscellaneous produce were some very fine potatoes.

Moulmein.—The arrangements and attendance were good; the show of stock was not good, but the grain exhibits were very interesting. Very good samples of til-seed, nutmegs, and betel-nuts were on view.

* Crude sugar in cakes.

Myinmu-Sagaing.—The heat was intense on the day the show was held, but the attendance was good and does not bear out the remarks of the Deputy Commissioner. The show was not so successful as last year. The cattle were the most successful exhibits.

EXPERIMENTS WITH AGRICULTURAL IMPLEMENTS.

Cawnpore chain pump.

22. One Cawnpore chain pump was obtained from the Director, Land Records and Agriculture, North-Western Provinces, at the cost of Rs. 65, and sent to Kyauksè district. The Deputy Commissioner, Captain Strickland, gave his personal attention to its erection on the banks of one of the irrigation canals, and he demonstrated to the Burmans that the pump would irrigate in half an hour what it took a Burmese lift a whole day to irrigate.

The Deputy Commissioner suggested certain improvements in the fixings of the pump, and a copy of his suggestions was sent to the Director, North-Western Provinces.

The pump has now been lent to a Burman who continues to work it for the irrigation of a plantain grove. The objections offered by the Burmans to the pump were the difficulty they would have in repairing the ironwork and the amount of labour involved in turning the pump-handle.

Sultan water-lift.

23. A patent "Sultan" water-lift worked by a yoke of bullocks and capable of lifting 3,000 to 4,000 gallons of water per hour was obtained during the year from Messrs. Sultan and Co., Madras, at a cost of Rs. 165, with the view to its introduction in the districts of the dry zone of Upper Burma. It was first forwarded to Shwebo, where, however, it could not be worked as the diameter of wells needed was 7 to 9 feet and the existing wells were only of 5 feet, and as it would be too expensive to sink a new well of the required dimensions, the lift was passed on to Mandalay for trial there. After exhibition there it will be transferred to another district. The Deputy Commissioner, Mandalay, has taken steps to irrigate a fertile piece of paddy-land from a canal which passes through the land, but the waters of which have hitherto never been utilized for irrigation purposes owing to their level being very much below that of the ground.*

A model of the lift has also been obtained from Madras to be placed on view at agricultural shows in Upper Burma.

Japanese rice-mill.

24. On the advice of Mr. B. Houghton, Deputy Commissioner, a model of a Japanese rice-mill was bought during the year for Rs. 71. A similar mill worked by steam-power is already in use in the Amherst district. The Japanese mill is worked by water-power. The model will be exhibited during the ensuing year at an agricultural show in Upper Burma.

With the prevailing high winds of Upper Burma, this mill could be easily worked with wind-power and thus save a deal of expense in avoiding the construction of a reservoir.

AGRICULTURAL EDUCATION.

25. One of the subjects discussed during the visit of Sir Edward Buck, Kt., C.S.I., in December 1895, was education in connection with agriculture. The resolutions on this subject which were passed by the Conference held at Simla on the 6th October 1893 were considered at a meeting presided over by Mr. D. M. Smeaton, Financial Commissioner, at which Sir Edward Buck was present. The Director of Public Instruction in a memorandum pointed out that in the Vernacular schools here agriculture was a compulsory subject as an alternative to geography, and that with regard to Anglo-Vernacular schools the introduction of a more practical course of instruction was a difficulty, as the teaching was framed to suit the requirements of the Calcutta University. After discussion the meeting was of opinion that it was as yet too early to make any change in

* The Deputy Commissioner has since reported that the cultivators consider that the lift is too costly for them and irrigates a larger area than they individually possess.

the course of studies in the schools here, and that a special training in practical agriculture was not required for any class of officials in Burma.

COLLECTION OF ECONOMIC PRODUCTS OF BURMA FOR THE INDIAN MUSEUM, CALCUTTA, AND THE IMPERIAL INSTITUTE OF THE UNITED KINGDOM, LONDON.

26. The following specimens of economic products were forwarded during the year to Dr. George Watt, M.B., C.M., C.I.E., Reporter on Economic Products to the Government of India, Calcutta :—

(1) Specimens of products used for dyeing yarns, boat sails, &c., as practised in Tavoy district, Lower Burma.
(2) Fruit, leaves, and bark of the bael tree (*Ægle marmelos*) obtained from Amherst and Prome districts, Lower Burma.
(3) Four combs and four models of pestles made from the wood of the bael tree (*Ægle marmelos*) obtained from Sagaing district, Upper Burma.
(4) Roots and leaves of three varieties of morinda (Al dye plant) obtained from Mandalay district, Upper Burma.
(5) Specimens of *Bixa Orellana* (Arnotto) pods, seeds, and leaves obtained from Amherst district, Lower Burma.

SECTION VI.

CATTLE-BREEDING AND VETERINARY ESTABLISHMENTS.

27. The subjects under the above heading are fully dealt with in the Report of the Civil Veterinary Department, 1895-96.

SECTION VII.

AGRICULTURAL AND FISCAL STATISTICS.

General.

28. A conference was held in Rangoon in December 1895, at which Sir E. C. Buck was present, to consider the uses of land-records for ascertaining agricultural distress or the gradual deterioration of any particular tract. It was agreed that a township book should be kept up showing the progress or decline of each village as ascertained from the statistics collected by the Land Records Department as regards area under cultivation, sales, mortgages, redemptions, and fertility of soil. The instructions for its upkeep are contained in Financial Commissioner's Circular No. 8 of 1896.

In order to ascertain fully the facts concerning the causes of the failure of any tracts to reach a condition of agricultural efficiency, it was arranged that the Director should accumulate information under the headings of the various causes of failure under the ledger system, and the headings at present chosen are "liability to drought" and "want of irrigation."

Rainfall statistics.

29. The report on the rainfall is now written separately. Numerical inaccuracies in the monthly statements are still of frequent occurrence. References to the number of 15 were made concerning discrepancies and in 43 cases the statements had to be returned for revision.

Crop reports.

30. Weekly crop reports showing the agricultural condition of each district were as usual received. They were more carefully prepared than in former years, but in 21 cases the reports were received too late to incorporate in the weekly returns, and 12 references had to be made regarding discrepancies. The Deputy Commissioners were informed by a circular (No. 11 of 1896) that in future the first indications or a failure of the harvest and the necessity for suspensions or remissions of revenue should be shown in the weekly crop reports.

Crop statistics.

31. Crop selections are now annually made by the District Officers for incorporation in the quinquennial return. In the past year 708 crop-cuttings were made. Of these 163 had to be rejected as valueless.

Monthly food-supply rates and fortnightly statements of retail prices.

32. No change has been made in the preparation of these statements. The latter are not as carefully checked as they should be by Deputy Commissioners, and the value of the information, more especially needed in the case of Upper Burma, is correspondingly vitiated. Twenty references had to be made on account of inaccuracies.

SECTION VIII.

TRADE AND TRADE STATISTICS.

33. The triennial report on the trans-frontier trade of this province has already issued; the report on the internal trade for the same period was due on the 20th September.

Internal trade registration.

34. The trade by land and boat between Upper and Lower Burma was registered at the same stations as in the preceding year. Figures of the rail-borne trade were compiled from invoices in the office of the Examiner of Railway Accounts; those of the steamer-borne traffic from manifests furnished by the Irrawaddy Flotilla Company and from statements supplied by the Port Officer, Rangoon, of stores, &c., carried in Government vessels.

External trade registration.

35. The number of stations registering trade with the adjacent foreign countries was 12 in Upper Burma and 7 in Lower Burma, one new station in Upper Burma and one in Lower Burma being opened during the year.

System of registration.

36. The system of registration of trade remains unaltered as it is found to work satisfactorily. The work at headquarters, however, continues to be heavy in consequence of the number of stations being added to every year. In spite of this, efforts are being made to prevent the accumulation of arrears and to bring out the returns more punctually during the year.

Cost of registration.

37. The total cost of trade registration was Rs. 17,869 made up as follows:—

	Rs.
Cost of registering internal trade	4,421
Cost of registering external trade	6,621
Cost of headquarters office	6,827
Total ...	17,869

Rice-crop estimates.

38. In order to ensure greater accuracy in future estimates District Officers were asked to weigh as samples the contents of a standard basket. The final estimate, which was issued after the end of January 1896, gave 1,545,000 tons of cargo rice as the available surplus.

A. GAITSKELL,
Offg. Director of the Department of Land Records and Agriculture.

RANGOON:
The 22nd October 1896.

APPENDICES.

APPENDIX A.

REPORT ON EXPERIMENTAL CULTIVATION IN THE SOUTHERN SHAN STATES FOR THE YEAR 1895-96.

THIS is the fifth annual report and is for the period 1st June 1895 to 31st May 1896.

2. *Grant.*—The grant for the year was Rs. 5,700, or Rs. 560 in advance of preceding year.

3. *Expenditure.*—For the financial year ending 31st March 1896 the expenditure was Rs. 6,163-5-8, or Rs. 463-5-8 in excess of the grant. This was, however, more than covered by the receipts from sales.

For the working year under report, namely, from 1st June 1895 to 31st May 1896, the total expenditure has been Rs. 6,538-13-8 (Statement I annexed), or Rs. 1,251-10-4 in advance of the year previous. The details of the expenditure are given in Statement II annexed, from which the main increase may be seen to have occurred under the head of "Orchard establishment" and "Conveyance of potatoes," details of which will be found in body of report.

Receipts.—There has been more than a correspondingly large increase in receipts, which are as follows:—

	Rs.	A.	P.
(1) Sale of vegetables	195	9	9
(2) Sale of fruits, &c.	89	1	3
(3) Sale of potatoes	2,560	2	7
(4) Sale of wheat	2,355	0	0
(5) For use of orchard carts	50	0	0
Total ...	5,249	13	7

or an increase of Rs. 4,292-6-5 upon last year.

Deducting receipts for sales from the total expenditure for the working year, the actual expenditure debitable to the grant is the small sum of Rs. 1,299-0-1, from which I think the progress made during the year in the condition of the orchard may be considered satisfactory. Statement I annexed will give the main heads under which all the receipts and expenditure have occurred and Statement II the details of expenditure under each of those heads.

4. *Work for the year.*—The quickset fence round the whole orchard of 41 acres has been filled in and clipped back into an impenetrable and picturesque fence, which now only requires clipping and keeping in shape annually to improve as a fence as years go by, and on which no other expenditure is necessary for annual repairs.

The pruning of the fruit trees in the old portion of the orchard has been carefully attended to.

The budding and grafting on to the indigenous stocks planted in the same has now been almost completed; each tree in it has been mulched with good rotten manure. A skeleton green-house has been erected of teak, upon which to grow and train grape vines.

Nurseries have been maintained for the supply of apple and pear and cherry stocks for the new extension and also for planting up the roads and compounds in the station.

In the new extension of 20 acres, however, has been the bulk of the work and expenditure. Last year 4 acres were reported as planted up. This year the remaining 16 acres have been fully planted entirely with apple and pear trees, with the exception of about 100 cherry stocks and 200 orange trees planted on either side of the main drains.

The potatoes put in last year have been dug and sold and another cold weather crop for seed has been sown and dug, and is now in the ground again between the rows of fruit trees.

The vegetable garden has been kept up throughout the year and is now well stocked. In addition to the work done in experimental cultivation proper, the road-sides throughout the civil station and the residency and court-house and office compounds have been planted up with nearly 1,000 trees of 12 varieties, all indigenous to the Shan States and selected for their shade, beauty, or utility.

A good deal of ground has therefore been covered, the details of which are given below.

5. *General remarks.*—Only indigenous labour has been used as heretofore and, although the villagers in the neighbourhood have now become quite conversant with the system of growth of European fruits, I find that I must, as time goes on, depend more and more upon trained men on the regular establishment and less on casual labour. The casual labour is too careless and casual to have working more than can be helped among the larger fruit trees in the old orchard. They do more harm than good. I find also that the pay of the regular establishment is not sufficient to keep them as it used to be. There has been growing up of late such a demand for coolies by the Department of Public Works and Telegraph and Postal departments on much higher pay than I give that my coolies are for ever being tempted away, and my present establishment of six men on regular pay of Rs. 12 a month are all new men and as ignorant and destructive as the casual village labourer. I am therefore going to propose a change in the present establishment so as to get them to remain to be trained and become efficient under-gardeners.

6. *Establishment.*—The head gardener, Mr. Colyear, has remained throughout the year and under his agreement his pay has risen from Rs. 125 to Rs. 150 a month since November 1895. He only joined the appointment in November of the previous year. For the year under report he has been drawing pay for the whole year and at an enhanced rate since November; hence the increase in the charges under the head of "Establishment." Maung Se, the overseer and general *factotum*, is becoming a most valuable man. In 1891 he was a peon in my office. He is an Upper Burman and had never seen or heard of any of our European vegetables or fruits. He seemed to take an interest in the vegetable garden when I first started it in 1891 and became my first gardener. From that he has worked his way up to be overseer on Rs. 25 a month, and as he is now gaining a fair knowledge of grafting, budding, pruning, and general management, I intend to raise his pay to Rs. 30, which he fairly and fully earns.

Maung Saye, my Court Interpreter in Shan, is as indefatigable as ever and, from having worked with the casual cooly labourers of the place in the orchard whenever they are required, he has gained a great knowledge of what is required of them and, as the coolies all know and respect him, he is now quite a valuable addition to the regular paid establishment.

Maung Po Mya, the treasurer, has been as indefatigable as ever and as successful in encouraging and supervising the growth of wheat by the village agriculturists. He was granted a bonus of Rs. 100 for his exertions by the local Government in the interest of the wheat industry.

There are seven garden coolies—one on Rs. 15 a month, who is in sole charge under me of the vegetable garden, and six on Rs. 12 a month each, who work in the orchard. The main work now among the fruit trees is of such a nature that I must manage to get them to remain longer than they now do. Their pay at present is Rs. 12 a month each. I propose to make the following change, namely, to have two on Rs. 12 a month, two on Rs. 13, and two on Rs. 14. There are also two on Rs. 15, one in the vegetable garden and one in my flower garden, a private servant, but always recruited by the best man among the orchard coolies. This change will add but little to the present expenditure and, with the prize of overseer on Rs. 30 a month to be competed for, it is hoped that the men will remain on longer so as to become what is required—trained under-gardeners.

7. *Vegetable garden.*—This has scarcely paid its way, the expenditure having been Rs. 5-8-6 in excess of the receipts. The excess expenditure is not large, but had it not been helped out by the Rs. 44-0-3 credited in June 1895, but really earned in the previous year, the deficit would have been heavy. Formerly the vegetables were sold in the bazaar, but during the year under review they were supplied to subscribers at Rs. 3 per month per house, and the rate is evidently fixed too low and for the future will be raised to Rs. 4, not a heavy demand for a good, daily supply of fresh vegetables. The garden has been worked under special difficulties as the former gardener Maung Pu, who had been working for three years, left suddenly in October, and the man I put in his place proved a failure, as I had to leave on tour before I could instruct him, and Mr. Colyear failed to pay the attention to the gardener I had expected from him. Then came very severe frosts in January-February, which cut down many of the vegetables and retarded the growth of all; and then succeeded an unusually hot and dry season, which again retarded growth, so that there is no doubt that the garden was worked under special difficulties this year. There is now, however, under a new gardener, a capital stock of vegetables of all sorts, and five houses are being supplied daily. The soil on the half of the garden which was denuded of the top soil in 1894 by flood is not yet what it was, but is improving and in another two years should grow good vegetables again. That flood was a most disastrous accident. I shall continue to keep up the garden if the subscribers are willing to increase their subscriptions to Rs. 4 monthly. If not, it must be closed, as I cannot get any of the local people to take it over on any terms to continue the growth of European vegetables for sale to the European community and I certainly cannot keep it up at a loss to Government.

8. *Wheat.*—No wheat was grown by me during the year, but 500 baskets of wheat seed was distributed to the cultivators for cultivation. As reported last year, in consequence of the action of the local Commissariat Officer, wheat had ceased to be grown or almost so. Late in the year, however, the local Government requested me to try and resuscitate the industry, and I was able to collect from the cultivators and distribute seed to the extent of 500 baskets. They would only consent to grow if I promised to take over the crop, and the rate fixed with them was Rs. 8 per basket, considerably below what it costs the Commissariat Department to import it at. The average weight of a basket of imported wheat is 105 pounds. Having therefore, with the consent of the local Government, undertaken to take over the crop direct from the hands of the cultivators, I induced some of them to make a fresh start at the cultivation. The crop is not yet all brought in, but 3,036·50 baskets have been received, and as the wheat is of most excellent quality and clean, the Commissariat have taken it off my hands as fast as I can arrange to make it over. It is made over to the Commissariat not by the basket but by the 105 pounds, and as the wheat is fresh and plump, though thoroughly well dried, the basket has averaged greater weight than the imported small and shrivelled grain and has left a substantial surplus in my hands, which has been made over to the Commissariat and credited to this account. In this way and for wheat made over last year, but only paid for in the year under report, the receipts for wheat have amounted to Rs. 2,355, a substantial assistance to my experimentalt culti-

vation grant. I have not yet arranged a programme with the Commissariat for next year's supplies, but I have no doubt that the good faith I have been allowed to observe this year with the cultivators and the punctual payments for their crop will do much to restore to them the confidence I had managed to build up in the earlier years of the cultivation, so rudely disturbed by the circumstances noted last year. If such is the case, I can no doubt reduce the rate to Rs. 6 a basket for next year and get every ounce of wheat grown that I am authorized by the local Government to *guarantee* to take over. Without such a guarantee *none* will be grown, as failing the Commissariat as a customer there is *no other* means of selling their wheat and they will consequently not grow it.

The sum due to Government for wheat supplied in 1893-94 to the Commissariat contractor as mentioned in last year's report still remains unpaid. A civil suit was filed in the Pyinmana Court, and my head clerk had to go down to give evidence with reference to the correspondence on the subject, and the Treasurer as the managing man in making it over, &c., much to the inconvenience of the work in my office, but up to the present no decision has been given in the case.

A portion of the money has since the filing of the suit been remitted by the Commissariat Department from money due by them to the contractor on clearing his account. When Government has all this trouble, expense, and delay in obtaining cash for wheat supplied to the Commissariat wheat contractor, is it any wonder that the cultivators are not keen to grow wheat for that department and deal with it direct?

10. *Potatoes.*—The new extension of the orchard was fully sown up as stated in last year's report. The land, however, had been so carelessly prepared and the seed so badly put in under the superintendence of Mr. Colyear while I was away on tour that only about a-third of the seed germinated; of that third the outturn was very poor.

The crop was dug up in September-October and amounted to 16,819·50 viss. Having gained experience from the preceding year, and the cart-road for the first time in this season being open to carts, the potatoes were placed in carts and sent down to the railway as they were dug so long as the cart-road remained open, and then the balance were put on to bullocks and sent down. I found the same difficulty in realizing a fair price for them at the railway and could not get an offer that would do more than pay the cart hire down. With the sanction of the Chief Commissioner I sent Mr. Browne down from the Myelat to endeavour to sell them at remunerative prices and he after much difficulty sold them at prices ranging from Rs. 14-8-0 to Rs. 17 per 100 viss, which was fairly remunerative. The cart or bullock hire down was Rs. 8 per 100 viss, so that there was a good margin of profit. This, however, was entirely due to the deputation of Mr. Browne as until he went the highest bid I could get was Rs. 9 per 100. He therefore converted a dead loss into a very fair profit, for which he has my hearty thanks. I also sold 703 viss locally at Rs. 15 per 100 and in one way and another managed to dispose of the whole crop. Of the quantity sent to the railway for sale 1,214 viss I had to strike off as they were said to have rotted with the journey or during delay there before sale. Notwithstanding these drawbacks, I have been able to credit the grant with Rs. 2,560-2-7 for potatoes grown on the land which since they were dug has all been planted up with apple and pear trees, and another crop of potatoes has been planted and is now well above ground in between the rows. The crop now in the ground is put in on land prepared under my own supervision and the seed sown was sown under the same advantages. Almost every seed has germinated and I shall be much surprised if the 734 viss of potatoes now sown on 7 acres do not produce a larger crop than was realized on the 18 acres sown in 1895.

Upon digging the tubers in September 1895 I continued the experiment tried for the first time last year of a cold weather crop, and on the 9th-12th October 1895 I put in 440 viss of the newly dug kidney potatoes.

Every one may be said to have germinated and no crop could look more promising than it did in December 1895. The same frost, however, which cut down the vegetables in the garden and the young quickset fences in the station cut the potatoes completely down when not quite half grown. The frosts were most unusually severe as the potatoes grown in the adjoining plot last year were not touched. In spite of the frost, however, I dug up 739 viss of nice fresh seed potatoes in May 1896 and at once sowed 734 viss of them again on 7 acres. In spite of the frosts, however, which will probably not be so severe again for some years, I nearly doubled my supply of seed by the cold weather crop, whereas had I stored the same in the godown instead of putting it in the ground I should certainly have halved it and the balance left to sow would have been a dried and shrivelled tuber instead of the fresh and healthy tuber that I have now sown. I am therefore trying to instil into the minds of the cultivators of the Myelat that they should not store their seed as they have heretofore done, but put it out to interest—so to speak—in the earth, and I hope to get them to appreciate this in time. I am sure it will make a vast difference in the quantity of seed tubers required and I anticipate a much better crop from the fresh strong young tuber seed than from the usual wizened old tuber that is kept round from the year before.

Mr. Browne reports that last year there was a marked increase in the export of potatoes from the Myelat, so much so that from the Myittha station alone from the station-master's books the exports had been ten times the amount of the year before.

This year again there has been a still further increase in the area under potatoes. New potatoes are now selling in the Myelat at 6 pies a viss, and a month hence, when the bulk of the crops commence to come in, the price will no doubt go down to one anna. Last year the usual wholesale selling price by the cultivators on the spot was Rs. 5 per 100 viss and, if they are so keen to increase their cultivation at that price, they must ultimately beat the Bengal potatoe out of the market in Burma and prices will then once more go up.

Potatoes from the Myelat commenced to find their way to the Rangoon market last year for the first time: Mandalay and Upper Burma generally have hitherto consumed them. As the Mandalay-Salween railway works its way towards Monè the cultivation of potatoes will no doubt extend in that direction. At present the Myelat is the only place where they can be grown at a profit on account of the long land carriage.

11. *Orchard.*—With the exception of filling in vacancies with apple stock there has been no planting done in the old orchard. The plantain trees are being rooted out by degrees and apple stock put in their place. The young shoots from the older apple and peach stock that were too far gone to graft on last year have now all been grafted and have taken capitally. The grafts of last year did not do well and many have had to be renewed this year; but, with the exception of the plums which are now being done, and the pears which are better budded later on, most of the work is complete. The peach trees are now many of them in full fruit, and as I have netted them to keep the birds away it is hoped, that some may this year be available for eating. The trees are yet small and the fruit is not yet in sufficient quantities to offer for sale.

Two plum trees have also fruited this year for the first time and there are a few casual apples on the young trees. The fruit, such as there is, is fine and well flavoured of its kind, and I have no doubt now that peaches and plums can be successfully grown

The strawberries that were so good last year have this year been a complete failure. This is Mr. Colyear's first year with them and he had a free hand to cultivate as he liked He adopted a system of planting on raised ridges, different to that adopted by me last year and, instead of getting a large crop, has succeeded in getting none worth eating. In my opinion he was all behind with the planting, and he quite neglected to irrigate them at the time the fruit was forming while I was away on tour. They consequently formed fruit, but had no moisture to fill and ripen the berries and, although I commenced to irrigate freely immediately on my return when I saw the state they were in, it was too late to do more than get a few dishes of berries of a very indifferent size and flavour. This was a great disappointment as I had largely extended the area under cultivation, hoping to have a lot for sale. For next season I will resume the cultivation myself, and hope to be able to make a better report.

For the growth of the grape vines which Mr. Colyear also took in hand a conservatory without glass was made. So far there has been no result, but the vines look healthy and, with any one who understands and has time to attend to the culture, I feel sure they should succeed.

The walnuts have made an excellent start to grow and the filberts and cob-nuts are also looking better.

Eighteen plants of the latter were kindly presented by Mr. Short, the Secretary to the Municipality, Rangoon, and are doing well. The frosts, so destructive to the vegetables, seem to have done all the fruit trees good and there is less insect life at the commencement of the rains than we have hitherto had to destroy the young growth.

The raspberries are, as they were, growing, but showing no signs of fruiting. I am trying some experiments to force them to fruit, but it is too early yet to know with what success.

The apple trees made more advance and showed more signs of eventual success this year than any of the other trees, or than they have hitherto done.

I am very confident of unqualified success with them when the grafts now put into the stock of the country come into bearing. The grafts put in last year were 70 per cent. failures, but those that have grown have made splendid growth.

The pear grafts did much better, only about 10 per cent. having failed. This year's apple grafts are almost without exception successful, showing that, while the operator knows how to operate, he has this year operated at the proper season. Last year he was months behind-hand.

Maung Se, the Overseer, whenever he can be spared from the other work in the orchard, which is not often, is of great assistance in these operations and has been very successful in those he has put in. He is not, however, as yet qualified to act independent of the guiding hand and experience of Mr. Colyear. If the peach plum, and pear-grafting is as successful as the apples, a large number of trees should be brought on to the indigenous stock during the year 1896, and the old orchard of 20 acres should be almost entirely stocked with fruit-bearing trees.

The oranges have made good growth, but show no signs yet of fruiting.

With the extension of Public Works building operations and of private requirements for water in the Taunggyi Civil station, the water-supply for irrigating purposes in the orchard is becoming more and more curtailed. So far, however, the Executive Engineer who has charge of the distribution of water in the canal has been able to give me sufficient for requirements.

It is to be regretted that with ample water at command the strawberries should have been such a miserable failure.

In the new extension 250 apple and as many pear trees imported from England less nine, which died, have been planted out. The trees were procured from Messrs. Low and Company, who made me a present of some last year, which were so strong and did so well. The present importation were as good.

Out of 500 plants, 491 have survived the journey, the potting into baskets, and the planting out, and are making excellent growth. That such a number of trees could come out from England and be planted in site with so few casualties is wonderful; it is due no doubt to the original strength of the plants and the excellent packing. Any one who wants good, strong, vigorous plants cannot do better than go to Messrs. Low and Company, Clapton Nursery, London. In former years I imported from Messrs. Smith of Worcester. Their trees did well, but do not come near those from Messrs. Low and Company. Having planted out these imported trees, the whole of the rest of the new extension was planted out with seedling apple and pear stock to graft on to next year, except on either side of the main drainage channels, and there I have planted oranges. I have also put in four rows of cherry stock, about 200 plants. The apple stock put into the 4 acres planted last year have all been grafted and almost every graft has taken.

12. *Jerusalem Artichokes and Rhubarb.*—The rhubarb grew well, as was the case the year before, all through the rains until August-September and then in a similar way died down and a great many of the plants rotted; some are still alive and commenced growth with the rains. With the apple and pear trees I also imported some more rhubarb crowns from England and Jerusalem artichokes and have planted them both in a part of the new extension, where there is some sand in the soil, with the hopes that they may be more successful there. Both rhubarb and Jerusalem artichokes are commencing to make growth with the rains.

13. *Concluding remarks.*—The experimental cultivation for which this grant was originated is now confined to fruit trees alone. The cultivation of vegetables, potatoes, and wheat has got beyond the experimental stage and it is clearly proved that they can all be grown with the same ease as the crops indigenous to the Southern Shan States. The cultivation of vegetables is only continued as a convenience to the Europeans of the station, until some energetic villager will take it off my hands and grow these vegetables for the bazaar. So far I have entirely failed to get any one to do this, but I suppose in time some one will be found to undertake it.

Wheat, though it can be grown anywhere almost, cannot be grown at a profit except near a railway or under contract by the Commissariat Department to purchase the crop It is useless to continue any further experiments with it. Potatoes can only be grown in the Myelat at a profit until we get a railway. The cultivation there is increasing very rapidly annually and nothing is at present required to stimulate it.

The experiment in fruit is encouraging: strawberries, peaches, and plums have fruited and produced good-sized and well flavoured fruit. The young apple trees have also produced a few stray apples of good quality, but it will be some years before they can be said to have "fruited." They have grown, however, this last year with such vigour that it is clear that they will fruit well when their time comes. That the strawberry crop this year was a failure cannot be attributed to the soil or climate. The head gardener is responsible for the failure.

The result of the working for the year has been a financial success, thanks to the wheat and potatoes. I fear there will be an interval between the compulsory cessation of the growth of these crops as the fruit trees increase in size and the time when the sale of fruit will bear an appreciable share of the expenses. As soon, however, as the fruit trees come freely into bearing the annual income should far exceed the expenditure from the sale of fruit alone, and the 41 acres of orchard should be a valuable property. Next year I hope to be able to commence to distribute fruit trees to the Chiefs or, at the latest, the year after.

The Deputy Conservator of Forests, Mr. Dun, expressed his willingness to assist in road-side tree planting.

The Executive Engineer, Mr. Litster, however, took it off his hands, as he had already established nurseries of young trees at stations along the road. I hope these will be successful, but have at present seen no results. The matter in this bleak, bare country should not be lost sight of, and so long as the road-sides are planted it does not matter who does it.

The Government cart-road is at present the only road in the Taunggyi Civil station that is not planted up; there are several roads not yet defined, which will be planted next year, if ready.

The trees planted by Mr. Giles two years ago about the station of Thamakan are well reported on by Mr. Browne, the present Subdivisional Officer, and when they grow up will be invaluable to the station.

From flowering plants accumulated by me from time to time there are now large quantities of geranium, roses, and chrysanthemums available for the public and are given away as applied for. Later on I may perhaps advertise them for sale.

A list of the stock of fruit trees in the orchard is appended as taken in November 1895. Since then there has been a considerable increase, both from importations and from grafting. Up to that date, as will be seen from the list annexed, out of some 400 trees grafted 200 were successful. When stock is taken next November I look for very much more satisfactory results.

TAUNGGYI:
The 2nd June 1896.

A. H. HILDEBRAND,
Superintendent and Political Officer,
Southern Shan States.

STATEMENT No. I.—*Actual total receipts and disbursements from 1st June 1895 to 31st May 1896 (year under report).*

Receipts.	Amount.			Disbursements.	Amounts.		
	Rs.	A.	P.		Rs.	A.	P.
(1) By budget allotment ...	5,700	0	0	(1) On orchard	4,492	5	6
(2) By sale of vegetables ...	195	9	9	(2) On garden	201	2	3
(3) By sale of fruits and others ...	89	1	3	(3) On potatoes	1,535	5	12
(4) By sale of potatoes ...	2,560	2	7	(4) On wheat	310	0	0
(5) By sale of wheat ...	2,355	0	0				
(6) By use of Government carts ...	50	0	0				
Total ...	10,949	13	7	Total ...	6,538	13	8

STATEMENT No. II.—*Details of disbursement from the 1st June 1895 to the 31st May 1896.*

Details.	Amount.		
	Rs.	A.	P.
(1) *Orchard.*			
(a) Establishment	2,594	3	0
(b) Clearing jungles	33	13	0
(c) Cart hire for conveying plants	59	0	0
(d) Coolie hire for planting trees	77	8	0
(e) Coolie hire for manuring fruit trees	27	14	0
(f) Cost of fruit trees	592	5	6
(g) Coolie hire for digging pits	231	1	0
(h) Making baskets	80	8	0
(i) Cost of garden tools	120	1	0
(j) Mending, digging drains, and weeding around fence	28	2	0
(k) Purchase and repair of carts	15	2	0
(l) Cost, &c., of bone manure	33	10	0
(m) Collecting seeds	38	8	0
(n) Temporary coolies working in orchard	10	2	0
(o) Building gardeners' houses	57	3	0
(p) Advertising strawberry plants	22	8	0
(q) Coolie hire for carrying earth for strawberry beds	13	14	0
(r) Purchase of scantlings, planks, and cart hire for grape vines	107	0	0
(s) Coolie hire for carrying draining pipes	27	8	0
(t) Clearing and weeding head gardener's compound	47	0	0
(u) Building head gardener's servants' quarters	84	0	0
(v) Making and fixing two gates	24	12	0
(w) Weeding	52	9	0
(x) Herding Government bullocks	47	8	0
(y) Coolie hire for building and thatching godowns and sheds	42	12	0
(z) Miscellaneous	23	14	0
Total ...	4,492	5	0
(2) *Garden.*			
(a) Establishment	162	0	0
(b) Purchase of seeds	39	2	3
Total ...	201	2	3
(3) *Potatoes.*			
(a) Conveyance { cart hire	741	0	0
(a) Conveyance { bullock	687	7	2
(b) Railway freight	7	8	0
(c) One basket of potatoes booked to Mandalay	0	12	0
(d) Cooly hire and cost of one bag	1	8	0
(e) Money-order commission	5	0	0
(f) Expenditure incurred for sending in money to Meiktila Treasury	2	3	9
(g) Coolie hire for digging and preparing ground for sowing potatoes	89	15	0
Total ...	1,535	5	12
(4) *Wheat.*			
(a) Cart hire for conveying wheat	10	0	0
(b) Building sabagyis	300	0	0
Total ...	310	0	0

STATEMENT No. III.—*Details of disbursement from the 1st June 1895 to the 31st May 1896.*

Details.	Amount.		
Total Expenditure up to 31st March 1896 from 1st June 1895.	Rs.	A.	P.
(*a*) Orchard	3,532	3	0
(*b*) Garden	189	2	3
(*c*) Potatoes	1,192	1	11
(*d*) Wheat	10	0	0
Total ...	4,923	7	2
Total Expenditure from 1st April 1896 to 31st May 1896.			
(*a*) Orchard	960	2	6
(*b*) Garden	12	0	0
(*c*) Potatoes	343	4	0
(*d*) Wheat	300	0	0
Total ...	1,615	6	6
Grand Total from 1st June 1895 to 31st May 1896.			
(*a*) Orchard	4,492	5	6
(*b*) Garden	201	2	3
(*c*) Potatoes	1,535	5	11
(*d*) Wheat	310	0	0
Total ...	6,538	13	8

List of fruit trees in Orchard, 1895.

Serial No.	Name.	From England.	From Saharanpur.	From Almora.	Buds and grafts		Plants not labelled.	Total of each.	Stocks.	1894.	Increase.	Decrease.
					Alive.	Failed.						
	Apples.											
1	Worcester Pearmain ...	4	...	...	...	...	...	4	...	4	*Nil*	*Nil*
2	Cashmere	...	2	...	...	...	...	2	...	2	...	...
3	Rymer	...	...	2	...	...	...	2	...	2	...	...
4	Cornish Gillyflower ...	...	...	3	...	...	...	3	...	3	...	...
5	Sturmer Pippin ...	1	...	...	...	...	...	1	...	1	...	...
6	Duke of Devonshire ...	...	2	...	...	...	...	2	...	2	...	...
7	Bramley's Seedling ...	6	...	...	1	...	...	7	...	4	3	...
8	Hawthornden ...	...	4	1	...	...	...	5	...	1	4	...
9	Cox's Orange Pippin	6	...	...	...	...	...	6	...	6	...	...
10	Stirling Castle ...	6	...	...	1	...	...	7	...	4	3	...
11	Blenheim Orange ...	7	...	...	5	...	...	12	...	6	6	...
12	Dutch Mignonne ...	...	1	...	...	...	...	1	...	1	...	...
13	Mannington's Pearmain	2	...	...	...	...	...	2	...	2	...	...
14	New Northern Greening	3	...	...	...	...	...	3	...	1	2	...
15	Devonshire Quarrenden	4	...	...	...	...	...	4	...	2	2	...
16	Ecklinville Seedling ...	4	...	...	1	...	...	5	...	5	...	...
17	Sykehouse Russet ...	...	...	1	...	...	...	1	...	2	...	1
18	Ribston Pippin ...	7	1	2	...	...	...	10	...	7	3	...
19	King's Pippin ...	1	2	1	...	...	...	4	...	1	3	...
20	Lane's Prince Albert	3	...	...	1	...	...	4	...	3	1	...
21	Dumelow's Seedling...	5	...	...	...	...	...	5	...	3	2	...
22	The Queen ...	4	...	...	...	...	...	4	...	2	2	...
23	Warner's King ...	3	...	...	3	...	...	6	...	3	3	...
24	Annie Elizabeth ...	3	...	...	...	...	...	3	...	3	...	...
25	Bess Pool ...	3	...	...	1	...	...	4	...	3	1	...
26	Golden White Pearmain	3	...	...	2	...	...	5	...	3	2	...
27	Lord Grosvenor ...	3	...	...	...	...	...	3	...	3	...	...
28	Cox's Pomona ...	2	...	...	...	...	...	2	...	2	...	...
29	Cockle Pippin ...	...	...	2	...	...	...	2	...	2	...	...
30	Northern Greening ...	2	...	...	...	...	...	2	...	...	...	...
31	Celine Pippin ...	2	...	...	...	...	...	2	...	...	...	...
32	Woodhurst Pippin ...	...	3	...	...	...	...	3	...	...	...	...

List of fruit trees in Orchard, 1895—continued.

Serial No.	Name.	From England.	From Saharanpur.	From Almora.	Buds and grafts		Plants not labelled.	Total of each.	Stocks.	Total 1894.	Increase.	Decrease.
					Alive.	Failed.						
	Apples.											
33	Early Harvest	...	3	...	...	...	...	3	...	...	...	...
34	Newton Pippin	...	3	...	...	...	...	3	...	...	...	...
35	Good Seedfield	2	...	...	...	...	...	2	...	...	...	...
36	Fairy	...	3	...	...	...	...	3	...	...	...	...
37	Nonpareil Northend... ...	...	2	...	...	...	...	2	...	...	...	...
38	New Hawthornden	2	...	...	...	...	...	2	...	...	...	...
39	Golden Reinette	...	2	...	...	...	...	2	...	1	1	...
40	Golden Harvi	...	2	...	...	...	...	2	...	...	...	...
41	Kentish Pippin	...	3	...	...	...	...	3	...	...	...	...
42	Melon Pippin	...	1	...	...	...	...	1	...	...	...	...
43	King Pippin	1	2	...	...	...	...	3	...	...	...	...
44	Oslin Pippin	...	4	...	...	...	...	4	...	...	...	...
45	Francis Pippin	...	2	...	...	...	...	2	...	...	...	...
46	Apple Almora, No. 1 ...	...	...	1	...	...	...	1	...	...	...	...
47	Apple Almora, No. 3 ...	...	...	1	...	...	...	1	...	...	...	...
48	King of Pippins	2	...	...	...	...	...	2	...	...	...	...
49	Peasgood Nonsuch	2	...	...	...	...	...	2	...	...	...	...
50	.....	...	...	...	...	34	13	13	536	...	...	...
	Total ...	93	42	14	15	34	13	177	536	84	38	1
	Cox's Golden Drop	...	...	...	...	...	...	...	...	3	...	3
	Duke of Oldenburgh ...	...	...	...	...	...	...	...	...	1	...	1
	Northern Spy	...	...	...	...	...	...	...	...	2	...	2
	Cornish Aromatic	...	...	...	...	...	...	...	...	2	...	2
	Total ...	93	42	14	15	34	13	177	536	92	38	9
	Pears.											
1	Marie Louise	2	3	...	13	...	...	18	...	5	13	...
2	Victoria	...	2	...	10	...	...	12	...	2	10	...
3	Louise Bonne de Jersey ...	3	3	...	7	...	...	13	...	7	6	...
4	Doyenne du Cornice	3	...	...	...	...	...	3	...	3	...	...
5	Glout Morceau	5	...	...	1	...	...	6	...	4	...	2
6	Jargonelle	5	2	...	20	...	...	27	...	7	20	...
7	Thomsons	...	...	1	...	...	...	1	...	2	...	1
8	Beurrè Superfin	1	...	...	2	...	...	3	...	2	1	...
9	Flemish Beauty	...	2	1	16	...	...	19	...	4	15	...
10	Pitmaston Duchess	5	...	...	2	...	...	7	...	3	4	...
11	Easter Beurrè	5	...	...	10	...	...	15	...	3	12	...
12	Huyshès Bergamotte ...	...	3	...	9	...	...	12	...	2	10	...
13	Bergamotte D'Espereu ...	2	...	...	2	...	...	4	...	2	2	...
14	William's Bon Chretien ...	3	...	...	...	...	...	3	...	2	1	...
15	Winter Nelis	3	...	...	4	...	...	7	...	3	4	...
16	Catillac	2	...	...	2	...	...	4	...	3	1	...
17	China	...	1	...	...	...	...	1	...	1	...	...
18	La Counto	...	30	...	...	...	...	30	...	...	...	...
19	Keiffer	...	31	...	...	...	...	31	...	...	...	...
20	Conseiller de la Cour ...	2	...	...	...	...	...	2	...	...	...	...
21	General Todleben	2	...	...	...	...	...	2	...	...	...	...
22	Beurrè Diel	2	...	...	...	...	...	2	...	...	...	...
23	River's Fertility	2	...	...	...	...	.	2	...	...	...	...
24	Beurrè Hardy	2	...	...	...	...	...	2	...	...	...	...
25	Beurrè D'Amaulis	2	...	...	...	...	...	2	...	...	...	...
26	Doyenne du Boussoch ...	1	...	...	...	...	...	1	...	...	...	...
	.....	...	...	...	...	11	8	8	79	...	...	...
	Total ...	52	77	2	98	11	8	237	79	55	99	3

List of fruit trees in Orchard, 1895—continued.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	Buds and grafts		Plants not labelled.	Total of each.	Stocks.	Total 1894.	Increase.	Decrease.
					Alive.	Failed.						
	Plums											
1	Kabul Greengage	...	1	..	...	...	...	1	...	1	...	...
2	Guthrie's late Greengage ...	...	2	...	4	...	...	6	...	2	4	...
3	Prince Englebert	7	...	...	...	...	...	7	...	7	...	...
4	Reine Claude de Violette ...	...	2	...	...	...	...	2	...	2	...	...
5	Jefferson	7	2	...	...	...	...	9	...	9	...	...
6	Washington	...	1	...	...	...	...	1	1	1	...	...
7	Victoria	5	..	...	3	...	...	8	...	6	2	...
8	Early Prolific	6	3	...	17	...	...	26	...	9	17	...
9	Alucha Black	...	1	...	...	...	...	1	...	1	...	...
10	Cheltinden Damson	1	...	...	...	...	...	1	...	1	...	...
11	Black Diamond	6	..	...	2	...	...	8	...	6	2	...
12	Golden Drop, Cox's	6	3	...	1	...	...	10	...	9	1	...
13	Early Dwarf Yellow... ...	...	1	..	...	...	...	1	...	1	...	...
14	Greengage	6	...	...	1	...	...	7	...	7	...	...
15	Bruhy's Greengage	...	...	2	3	...	...	5	...	1	4	...
16	Smith's Purple Prolific ...	3	...	...	...	...	...	3	...	3	...	...
17	Alucha Red	...	1	...	...	...	...	1	...	1	...	...
18	Denniston's Superb	6	...	...	...	...	...	6	...	6	...	...
19	Goldengage	...	2	...	5	...	...	7	...	2	5	...
20	Alubukhara, large	...	1	...	...	...	...	1	...	1	...	...
21	Asperie	...	1	...	...	...	...	1	...	1	...	...
22	Prune	...	1	...	2	...	...	3	...	1	2	...
23	.....	...	...	...	...	108	4	4	141	...	...	...
	Total ...	53	22	2	38	108	4	119	142	78	37	...
	Reine de Bavay	...	...	...	...	...	...	...	...	1	...	1
	Large Yellow	...	...	...	...	...	...	...	...	1	...	1
	Total ...	53	22	2	38	108	4	119	142	80	37	2
	Peaches.											
1	Early Rivers	...	...	9	6	...	...	15	...	9	6	...
2	Large Agra	...	2	...	...	...	...	2	...	2	...	...
3	Hardoi	...	1	...	...	...	...	1	...	1	...	...
4	Violette Hative	3	...	...	1	...	...	4	...	3	1	...
5	Country No. 2	...	3	...	...	...	...	3	...	8	...	...
6	Rhenny Shipstone	...	...	1	1	...	...	2	...	1	1	...
7	Dr. Hogg	...	...	2	...	...	...	2	...	2	...	...
8	Honey	...	...	2	...	...	...	2	...	2	...	...
9	China flat	...	1	...	...	...	...	1	...	2	...	1
10	Grosse Mignonne	4	...	...	2	...	...	6	...	3	3	...
11	Stirling Castle	...	...	2	1	...	...	3	...	2	1	...
12	Anderson's Spring Hill ...	...	...	1	...	...	...	1	...	1	...	...
13	Early York	...	...	1	...	...	...	1	...	1	...	...
14	Prince of Wales	2	...	...	...	...	...	2	...	2	...	...
15	Belle Garde	2	...	...	...	...	...	2	...	2	...	...
16	Alexander Noblesse	3	...	...	1	...	...	4	...	2	2	...
17	Royal George	3	...	...	2	...	...	5	...	3	2	...
18	Peach, Madras	...	2	...	7	...	...	9	...	...	..	...
19	Crimson Galande	3	...	...	7	...	...	10	...	3	7	...
20	Country No. 4	..	3	...	...	...	...	3	...	...	...	...
21	Hakim	...	2	...	...	...	...	2	...	1	1	...
22	Country No. 3	...	1	...	...	...	...	1	...	...	...	...
23	Country No. 4	...	1	...	...	...	...	1	...	...	...	...
24	.....	...	...	...	...	52	4	4	202	...	...	...
	Total ...	20	16	18	28	52	4	86	202	50	24	1

List of fruit trees in Orchard, 1895—continued.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	Buds and grafts		Plants not labelled.	Total of each.	Stocks.	Total 1894.	Increase.	Decrease.
					Alive.	Failed.						
	Apricots.											
1	Hemskirk	4	2	...	...	...	...	6	...	7	...	1
2	Moorpark	5	3	4	1	...	...	13	...	13	...	...
3	Large Early	4	...	...	...	...	...	4	...	4	...	...
4	Cashmere	...	3	...	...	...	...	3	...	3	...	...
5	New Large Early	...	...	2	...	...	...	2	...	2	...	...
6	Royal	...	...	3	2	...	...	5	...	4	1	...
7	Brussels	...	...	2	2	...	...	4	...	2	2	...
8	Early Orange	...	...	2	1	...	...	3	...	2	1	...
9	Frogmore Early	...	...	2	...	...	...	2	...	2	2	...
10	Golden Drop	...	2	...	...	...	...	2	...	2	...	...
11	Mexican	...	2	...	...	...	...	2	...	2	...	...
12	.....	...	...	...	...	...	11	11	...	...	...	...
	Total ...	13	12	15	6	...	11	57	...	43	6	1
	Nectarines.											
1	Claremont	...	2	...	...	...	...	2	...	2	...	...
2	Kabul	...	2	...	...	...	...	2	...	1	1	...
3	Murray	...	2	...	4	...	...	6	...	2	4	...
4	Peach	...	...	1	...	...	...	1	...	2	...	1
5	Elruge	3	...	...	...	...	...	3	...	3	...	...
6	Lord Napier	2	...	...	...	...	...	2	...	3	...	1
7	Pitmaston Orange	3	...	...	8	...	...	11	...	3	8	...
8	New White	...	2	...	...	...	...	2	...	2	...	...
9	Hardwick's Early	5	...	...	3	...	...	8	...	4	4	...
10	.....	...	...	...	...	...	3	3	...	...	...	...
	Total ...	13	8	1	15	...	3	40	...	22	17	2
	Cherries.											
1	May Duke	6	...	...	...	...	...	6	...	6	...	...
2	Bigarreau Napoleon	6	...	...	...	...	...	6	...	6	...	...
3	Warder's Early Black ...	8	...	...	...	...	...	8	...	8	...	...
4	Bigarreau	5	...	...	...	...	...	5	...	6	...	1
5	Kentish	6	...	...	...	...	...	6	...	6	...	...
6	Knight's Early Black ...	6	...	...	...	...	...	6	...	6	...	...
7	Florence	5	...	...	...	...	...	5	...	6	...	1
8	Morello	3	...	...	...	...	...	3	...	5	...	2
9	Elton	3	...	...	...	...	...	3	...	6	...	3
10	Almora No. 207	...	...	2	...	...	...	2	...	...	...	...
11	....	...	...	...	...	...	1	1	...	...	...	...
	Total ...	48	...	2	...	...	1	51	...	55	...	7
	Currants.											
1	Red Dutch	16	...	...	...	...	...	16	...	22	...	6
2	Raby Castle	2	...	...	...	...	...	2	...	10	...	8
3	Black Naples	5	...	...	...	...	...	5	...	10	...	5
4	Lee's Prolific Black	...	...	...	...	...	...	...	...	2	...	2
	Total ...	23	...	...	...	...	...	23	...	44	...	21
	Gooseberries.											
1	White Smith	4	...	...	...	...	...	4	...	11	...	7
2	White Lane's Industry ...	4	...	...	...	...	...	4	...	8	...	4
3	Crown Bob	3	...	...	...	...	...	3	...	7	...	4
4	Warrington	...	...	...	...	...	...	...	...	4	...	4
	Total ...	11	...	...	...	...	...	11	...	30	...	19
	Figs.											
1	Brown Turkey	6	...	...	...	...	...	6	...	6	2	...
2	Large Negro	2	...	...	...	...	...	2				
	Total ...	8	...	...	...	...	...	8	...	6	2	...

List of fruit trees in Orchard, 1895—concluded.

Serial No.	Name.	From England.	From Saharanpur.	From Almora.	Total of each.	Total 1894.	Increase.	Decrease.
	VINES.							
1	Black Hamburg	6	...	...	6	...	...	...
2	Miss Pearson	...	...	1	1	2	...	1
3	Gros Colmar	...	...	2	2	2	...	...
4	Muscat Alexandri	1	...	...	1	...	...	...
5	Trentham Black	...	...	2	2	2	...	...
6	West St. Peter	...	...	2	2	3	...	1
7	(Without label)	...	...	...	1	...	...	...
	Total ...	7	...	7	15	9	...	2
	NUTS.							
1	Walnuts	...	...	...	32	14	18	...
2	Hazel-nuts	...	...	...	9	...	...	...
3	Cob-nuts	...	...	...	10	4	6	...
4	Filberts	...	...	...	6	10	...	4
	Total ...	...	...	...	57	28	24	4
	Quince	...	...	...	5	...	...	...
	Mulberry	...	...	...	1	...	...	...
	Plantains	...	...	...	288	421	...	133
	Vacancies	...	...	...	163	...	...	...

APPENDIX B.

Extract from Report of Mr. J. MYLNE, on the progress made on the land granted him at Kyauktaga, Pegu district.

THE first statement gives the number of families and persons now on the land including those of the report, dated the 28th July 1894, *i.e.*, 163 families of 654 persons, being an average of four persons per family.

During the eight years from 1886 to 1894 the deaths were 13·5 and desertions a little over 4 per cent. the same proportion will probably apply to the year 1894-95.

In addition to the usual paddy crop there are 130 bighas of land under sugarcane, 37 of which will be crushed this season: 60 bighas are under oil seeds.

The families have their private garden crops which are various, including in some cases potatoes and cabbages. For sugar-cane and oil-seed crushing there are six Beheea cane-mills and a patent oil-mill at Kyauktaga.

The second paper is a financial statement up to the end of July last.

The sum invested is Rs. 1,10,000. In round numbers 38,000 of this has been for initial experiments of kinds, prospecting, buildings, wells, &c.; 24,000 for management, general charges, leaving Rs. 48,000 as advances for passage, food, clothing, bullocks and maintenance till the emigrants can open up the land and support themselves. This sum may be recovered.

The 48,000 divided over the 163 families is Rs. 244 on each household.

The people have now proved for themselves that sugarcane will grow freely and are ready to take advantage of the fact; but we have to find a market for the product of their cane fields which during this season will probably be 30,000 viss of kyauntaga and next season four times that quantity.

* * * * *

The statements herewith afford us a good opportunity just now of taking stock of our position and the conclusions one cannot help coming to are—

(1) That though in a new enterprise like this the incidence of the cost of European management is very heavy, yet any increase in salaries can

only be justified and reasonably asked for and given when the venture shows some signs of responding to the very generous expenditure incurred in it.

(2) We should decide upon not sending over any more settlers till we get back the Rs. 48,000 of our outstanding advances, which sum we can only recover if the cultivation of cane and the manufacture of marketable raw sugar to suit Burmese tastes succeed.

(3) The families already on the grant, even half their number, can prove to our satisfaction during the next two or three years, whether or not we are justified in sinking in Burma any more of the income that accrues to us in Shahabad.

APPENDIX C.

EXTRACTS FROM THE REPORTS ON THE AGRICULTURAL SHOWS HELD DURING THE YEAR 1895-96.

(*a*) *Letpadan* (*Tharrawaddy*) *Show, held 26th and 27th February 1896.*

Remarks by the Deputy Commissioner, Tharrawaddy district.

* * * *

As anticipated the show was a great success; the people acted very well and showed their appreciation by their large attendance, no less than 5,000 to 6,000 persons being present, and also by the large number of exhibits exposed, 234 exhibits being entered for competition. These figures show an increase of over 1,000 persons in the concourse of spectators and 100 more exhibits than in the previous year. These annual agricultural shows may therefore well be calculated to be growing in popularity and to be appreciated among the Burmese agriculturists.

* * * *

The Judges for the exhibits at the show were—

Captain J. J. Cronin, Deputy Commissioner.
Dr. C. G. Roberts, Civil Surgeon.
Mr. L. E. Palmer, Superintendent of Land Records.
Mr. A. Wood, Forest Department (representing Deputy Conservator of Forests).
Maung Shwe Bwin, Subdivisional Officer.
Shaik Safdar Hussain, Township Officer.
Mr. J. C. Batlivala, Assistant Veterinary Instructor.

There was an excellent show of agricultural stock. The animals exhibited were splendid specimens, which made the selection of the best animals an extremely difficult task. This was eminently the case in the matter of cart-bullocks, of which a really fine lot were exhibited. It was, however, gratifying to see the pair awarded the first prize at the show win the first prize in the cart races that followed the afternoon. No good Burmese ponies or mares were exhibited and the prizes for them were therefore withheld. As decided last year, no prizes were awarded for half-bred ponies. Two additional prizes were awarded for dwarf plough oxen. Not a single pig was entered for competition and the allotment for boars and sows with litters therefore remained undisbursed. Only one milch-goat was exhibited, which was awarded a prize of Rs. 5.

The garden produce exhibited was also of fine quality and showed the resources of the district. There was one exhibit of horse gram (kullabè), which was awarded a special prize by Dr. Roberts. The prizes under the head "pumpkins and gourds" were awarded to exhibits of calabashes, which far surpassed the pumpkins in quality. There was also one exhibit of wheat grown in the Tapun township of this district, for which a special prize was awarded by the Deputy Commissioner. The special prize awarded by the Deputy Commissioner for hemp or jute was carried off by the Reverend Father Perroy, who exhibited a viss of cleaned fibre grown at Thônzè.

Additional prizes were awarded for exhibits of bamboo-work, pottery, weaving and embroidery, and fishing implements.

* * * *

By the kind assistance of the Traffic Superintendent of the Burma State Railway arrangements were made for the carriage of exhibits and visitors to the show and back at greatly reduced rates.

* * * *

(*b*) *Moulmein* (*Amherst*) *Show, held 28th January 1896.*

Remarks by the Committee of the Agri-Horticultural Society.

* * * *

The Local Government gave a grant of Rs. 460 for the agricultural show, while the public subscribed Rs. 630 for the Horticultural portion.

The entries of cattle and produce were a slight improvement on last year, but until the officers stationed in the district take some interest in the show by persuading cultivators to compete, we fear the object of Government will not be attained.

* * * *

In the classes for cattle entered the animals were passable, but with two or three exceptions nothing above the general average. There were 18 animals exhibited, all of which were brought from the Zaya township.

The grain exhibits were the most interesting items in the show, all the samples shown being excellent. There were 25 exhibits of paddy consisting of kaukyi, shangalay, and yalème, the Bilugyun sample as usual being the best.

Some very good samples of til seed, nutmegs (from Amherst), and betel-nuts were shown. Uncured tobacco was exhibited by a Burman residing at Meinmalagyun, but it was grown from the usual common seed, the exhibitor explaining that the Havana seed he had received from the Society germinated freely, but owing to early sowing the whole of the seedlings were killed by the heavy rain which closed the monsoon.

The attendance was good and a military band, pwè, and a bicycle race were arranged as extra attractions. There would have been a larger number of visitors, but unfortunately the Pagoda festival was held at Martaban the same day.

Mrs. Irwin very kindly distributed the prizes, and Messrs. Evans (the Government Veterinary Superintendent), Shaw, Dodd, Maung Shwe Po, Ko Moh, and Singaravaloo Pillay judged the exhibits.

* * * *

(*c*) *Henzada Show, held 7th March 1896.*

Remarks by the Deputy Commissioner, Henzada district.

The second annual agricultural show was held at Henzada in temporary sheds erected for the purpose in the open spacious maidan opposite the Police lines. There was a large gathering of spectators, numbering from 4,000 to 5,000 in all, to witness the scene, and I think I may venture to say it was generally admitted by those present that this was the most successful show ever held at Henzada.

* * * *

Several exhibitors from Sanywe and Mônyo townships of Tharrawaddy district presented themselves with divers articles of natural products, whereas we had no exhibits from Danubyu or Kyônpyaw. I would suggest that Mônyo and Sanywe be substituted for Kyônpyaw and Danubyu or in addition to them.

* * * *

(1) The buffaloes exhibited were comparatively few in number, but of good quality.

(2) The bullocks were a splendid show and the judging of the prizes was a matter of difficulty. The first prize was won by Maung Pe Gyi in the past year and the same man's bullocks were found to excel all others this year, but, with a view to encourage other exhibitors, the man was only granted a certificate. The two money prizes of Rs. 20 and Rs. 10 respectively with certificates were awarded to Maung Po and Maung Tôk of Kangyi and Sitkwin villages.

(3) The milch kine exhibited were few in number. The best cow as well as the best bull were exhibited by the Reverend J. Price, who won the prize last year. Mr. Miller's bull and Mr. Phipp's cow came in a good second in each class.

(4) The ponies exhibited were some of them good.

(5) The exhibits of the various kinds of paddy were very numerous and the kinds of paddy for which prizes were awarded were "nga kywe," "kallagyi," and "bawyut."

(6) Of the other agricultural products the best were beans, tobacco, pumpkins, tomatoes, chillies, yams, and brinjals An exhibit of some fine potatoes was made and as no prize was allowed for this, the Deputy Commissioner gave a special prize.

* * * *

(*d*) *Mandalay Show* (not held).

(*e*) *Myinmu* (*Sagaing*) *Show.*

Proceedings of the Committee.

The second annual agricultural show was held at Myinmu on the 26th March 1896, and was open to the Sagaing and Lower Chindwin districts as in the previous year.

Notices were widely circulated in both districts to ensure the success of the show, but no exhibitors came from the Lower Chindwin district. The distance to be travelled and the great heat were the probable causes of this. No exhibitors came from the Sagaing, Padu, and Ava townships of the Sagaing district as it was alleged that there were no exhibits this year worthy of being sent for competition. Notwithstanding this some 5,000 and

6,000 people were present, and there would probably have been more had the year not been an unfavourable one for the harvest and the condition of the villagers considerably affected thereby.

* * * *

In the morning the exhibits were carefully gone through, the greatest competition being amongst the cattle. There was only one exhibit of a stallion, litter of pigs, brood of chickens and ducklings; and no doubt in the case of these last three would-be competitors were afraid that their animals might suffer from the heat.

* * * *

In the afternoon successful exhibitors appeared for the distribution of prizes. Before they were awarded, a petition by the elders of the Myinmu subdivision was read thanking Government for the show and asking that it might be repeated. My opinion is that the show should not be repeated and that a small place like Myinmu, which I believe was chosen as being an "agricultural centre," but which is no more an agricultural centre than almost any other subdivisional headquarters, is quite unsuited for a thing of this kind. If shows are to be held, they should be held in large places like Rangoon, Mandalay, or Bassein, where there are sure to be numerous suitable exhibits on the spot and where pressure would not be required to induce people to attend.

It is too much to expect many Burmans to incur the trouble and expenses of two days' journey there and back on the off chance of winning a prize of Rs. 10 or Rs. 20.

This year Rs. 370-12-0 was subscribed locally and was devoted to the usual pwes and boxing matches, a balance of Rs. 192-5-0 remaining to be carried forward to next year.

On the whole the show was as great a success as could be expected.

(*f*) *Kyaungdawya (Minbu) Show held 26th and 27th February 1896.*

Remarks of the Commissioner, Southern Division.

* * * *

The show has been a success and should be held yearly on the same date and place. Captain Johnson has taken great interest in the matter and the people are now beginning to understand what is meant by an agricultural show. I think that Government should endeavour to become possessed of any really good Burma stallions which may be produced at these shows.

Proceedings of the Committee.

* * * *

The last show was held in 1895 on same date and place. Advantage was taken of the great religious fair and gathering at the Kyaungdawya pagoda on the full moon of Tabaung and the date was fixed accordingly. The show was well advertized and special invitations sent to all persons likely to take an interest in it.

* * * *

Produce.—The only produce for which prizes were offered were garden fruits and vegetables. The exhibits were much more numerous and of better quality than in the previous year. The fruits exhibited included plantains of varieties, jack, limes, papaya indica, and cocoanuts. The vegetables were potatoes, four varieties of pumpkin, sweet potatoes, chillies, Indian corn, pulses, and brinjals.

There were 30 exhibitors in all.

The only collection of English vegetables was shown by the Minbu Jailor, but one Burman exhibitor from Salin brought cabbages grown in his own garden.

The potatoes were grown at Sagu and were fair specimens. The brinjals were remarkable for their size.

In future years prizes should be offered with a view to encouraging selection of seed and the introduction of superior kinds of produce.

Poultry.—The only poultry exhibited consisted of ten broods of chickens, all very large and healthy. Ducks are reared in the district, but at too great a distance from Kyaungdawya. For next year the prizes offered for geese and ducklings should be omitted.

Implements.—There were some 40 sets of agricultural implements exhibited. Some of the collections were very perfect. A plough, which could be used as a two, three, four, five, or eight-tooth plough successively, was awarded a special prize. Several sets of implements used for irrigation were exhibited, but there was no improvement on the prevailing methods. The prize money should, however, be increased so as to cover cost of cartage.

The district is wanting in simple machines and methods for dealing with produce after it is gathered. Prizes should in future be awarded for such simple mills as are used for sessamum oil-crushing. There was only one well with troughs and water-lift and surrounding garden. The Committee did not award a prize as it was a work of long standing.

Cattle.—The cattle section of the show was, as last year, a distinct success. Two hundred pairs of draught and 300 pairs of agricultural bullocks were exhibited, 20 pairs of

buffaloes, five bulls, and four milch cows. The prize for the best bull should be increased next year as it is very necessary to encourage the rearing of good stock.

Four cattle pens were constructed for the exhibition. In future years these stalls should be erected on the spot and the prize-money increased to pay for cartage.

The ornamental carts were as gaudy and numerous as usual, an elaborately finished one from Sagu obtaining the first prize. A prize should be offered for the best non-ornamental cart made in the district.

Ponies.—The show of ponies was much better than last year both in respect of numbers and size and quality of stock. There were five stallions, a superb young iron-grey carrying off the first prize. Over 40 ponies (non-stallions) were brought to the show; these included a pony 14 hands and one 13·3 of pure Burman stock. High prices were asked. Two special prizes were awarded for brood mares with foals. Five such mares were exhibited. A substantial prize should be included in future in the list for this purpose.

On the whole, poultry excluded, the show was a success, and will be an important stimulus to agricultural improvements in the district. We must not expect immediate and startling improvements; if we continue patiently as we have commenced, good results are sure to be obtained in the end.

Two suggestions, based on the experience derived from this and last year's show, offer themselves:—

First.—To encourage the getting up of agricultural associations where matters connected with agriculture may be discussed and where Subdivisional and Township Officers might personally point out improvements to be undertaken, especially as regards cattle-breeding, food and shelter for cattle, and prevention and cure of cattle-disease. The actual cultivator could thus be approached and instructed direct.

Second.—*Government co-operation.*—I do not know what is being done in the district to secure proper and adequate grazing-grounds, but the provision of pasture-grounds is the most direct manner in which Government can co-operate with the cultivator. I also think that small agricultural loans might be made, with some effect, to cover initial cost of improvement on experiments.

(*g*) *Yamèthin Show* (not held).

APPENDIX D.

STATEMENT No. IV.—*Distribution list of seed obtained for experimental cultivation during 1895-96.*

No.	How distributed.		Maize (a).		Tobacco (b).		English vegetable seeds (c).		Wheat (d).		Grain (e).		Potato (f).		Hemp (g).		Jute (h).	
	District.	Designation or name of officer receiving seed.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Lower Burma.		Cobs.		lbs.		lbs.		Mds.		Mds.		Mds.		Pyis.		Pyis.	
1	Akyab ...	Deputy Commissioner	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	5	25th April 1895 ...	...	.....
2	Hanthawaddy	Ditto ...	50	27th April 1895 ...	3	24th July 1895 ...	...	.....	...	.....	...	.....	...	.....	6	25th April 1895 ...	...	.....
3	Tharrawaddy	..	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	20 plants	.....	7½	24th May 1895.
4	Prome ...	Deputy Commissioner	30	26th April 1895 ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....
5	Bassein ...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	25 lbs.	7th November 1895	7½	24th May 1895.
6	Myaungmya ...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	25 lbs.	7th November 1895	7½	24th May 1895.
7	Toungoo ...	Mr. J. Petley ...	20	26th April 1895 ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....
8	Salween ...	Deputy Commissioner	60	26th April 1895 ...	...	.....	...	.....	...	.....	...	.....	...	.....	2	24th April 1895 ...	...	.....
9	Shwegyin ...	Ditto ...	65	25th April 1895 ...	2½	24th July 1895 ...	...	.....	...	.....	...	.....	...	.....	10	24th April 1895 ...	7½	25th April 1895.
10	Amherst ...	Ditto ...	40	26th April 1895 ...	1	24th July 1895 ...	...	.....	...	.....	...	.....	...	.....	18	24th April 1895 ...	7½	25th April 1895.
11	Tavoy ...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	7½	25th April 1895.
12	Mergui ...	Deputy Commissioner	30	2nd May 1895 ...	2	24th July 1895 ...	...	.....	...	.....	...	.....	...	.....	1	24th April 1895 ...	...	.....
	Upper Burma.																	
13	Pakôkku ...	Deputy Commissioner	50	26th April 1895 ...	1½	24th July 1895 ...	3	23rd October 1895...	...	.....	...	.....	...	.....	...	.....	...	.....
14	Magwe ...	Ditto ...	40	26th April 1895 ...	1½	24th July 1895 ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....
15	Mandalay ...	Ditto ...	60	26th April 1895 ...	3	24th July 1895 ...	3	23rd October 1895...	...	.....	...	.....	...	.....	...	.....	...	.....
16	Bhamo ...	.....	...	.....	...	.....	3	23rd October 1895...	...	.....	...	.....	...	.....	...	.....	...	.....
17	Myitkyina ...	.....	...	.....	...	.....	3	23rd October 1895...	...	.....	...	.....	...	.....	...	.....	...	.....
18	Katha ...	Deputy Commissioner	50	26th April 1895 ...	...	.....	3	23rd October 1895...	...	.....	...	.....	...	.....	...	.....	...	.....
19	Ruby Mines ...	Ditto ...	50	26th April 1895 ...	...	.....	3	23rd October 1895...	1	25th July 1895 ...	3	25th July 1895	...	.....	...	.....	...	.....
20	Shwebo ...	Rev. J. Stockings ...	30	26th April 1895 ...	1	24th July 1895 ...	3	23rd October 1895...	...	.....	...	.....	...	.....	...	.....	...	.....
	Sagaing ...	Deputy Commissioner	50	26th April 1895 ...	1½	24th July 1895 ...	3	23rd October 1895...	...	.....	...	.....	...	.....	...	.....	...	.....
21	Lower Chindwin.	Ditto ...	50	26th April 1895 ...	1½	24th July 1895 ...	3	23rd October 1895...	...	.....	...	.....	...	.....	...	.....	...	.....
22	Upper Chindwin.	Ditto ...	50	26th April 1895 ...	½	24th July 1895 ...	3	23rd October 1895...	...	.....	...	.....	...	.....	...	.....	...	.....
23																		
24	Meiktila ...	Ditto ...	100	26th April 1895 ...	½	24th July 1895 ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....
25	Myingyan ...	Ditto ...	50	26th April 1895 ...	½	24th July 1895 ...	3	23rd October 1895...	...	.....	...	.....	...	.....	...	.....	...	.....
26	Chin Hills (Falam).	.....	...	.....	...	.....	3	23rd October 1895...	1	1st August 1895 ..	...	.....	1	1st August 1895.	...	.....	...	.....
		TOTAL	875	.....	20	.....	36	.....	2	.....	3	.....	1	.....	42 pyis. 50 lbs. 20 plants	.....	45	.....

(a) American maize (three varieties).
(b) American tobacco (Havana and Virginia).
(c) English vegetable seeds (Sutton's).
(d) Sagaing wheat.
(e) Mandalay gram.
(f) Southern Shan States (potato).
(g) Agri-Horticultural Society, Calcutta.
(h) Botanical Gardens, Sibpur.

STATEMENT No. V.—*Showing description of seeds received together with the cost of consignment, and of distribution during 1895-96.*

Seeds.		From	Date of receipt.	Cost of consignment.	Cost of distribution.
Description.	Quantity.				
				Rs. A. P.	Rs. A. P.
Maize ...	900 cobs	America (D. Landreth and Sons, Philadelphia, U. S., A).	15th April 1895.	439 9 0	40 0 0
Tobacco ...	20 lbs.	Ditto ...			
Vegetable ...	36 lbs.	England (Sutton and Sons)	11th October 1895.	246 7 9	10 5 6
Wheat ...	2 maunds	Sagaing	27th August 1895.	10 1 0	1 0 0
Gram ...	3 maunds	Mandalay	27th August 1895.	13 6 0	...
Potato ...	1 maund	Southern Shan States ...	16th October 1895.	...	...
Sunn hemp	2 maunds	Agri-Horticultural Society, India.	27th February 1895.	31 0 0	5 7 0
Jute seed ...	2 maunds	Ditto ...	12th March 1895	27 0 0	5 12 0
Sisal hemp...	20 plants	Royal Botanical Gardens, Sibpur.	17th July 1895	3 9 0	2 8 0
		Total ...	...	771 0 9	65 0 6

STATEMENT No. VI.—*Experimental cultivation—American maize.*

No.	District.	Particulars regarding experiments.	Result of experiment.
		LOWER BURMA.	
1	Thatôn ...	Distributed in the Kyaikto subdivision.	The experiment in the Kyaikto subdivision failed entirely. In many cases the seed did not even germinate.
2	Toungoo ...	Mr. J. Petley, Nancho Estate, Karen Hills cultivation.	Some seed was distributed to Karens on the hills and some was sown at his plantation and in two places in the town. The experiments on the hills, in the plantation, and in the town have not turned out so well this year; there were failures in growth and development, more especially of the white kind on the hills and the yellow kind in the town. Mr. Petley remarks that the corn sown by natives near Toungoo and in the surrounding villages has grown very favourably and plentifully.
3	Do. ...	Experimented by Mr. T. McKeon at the Experimental Farm.	Two cobs of American maize, one white and one of the yellow variety, were given to Mr. Allmark, of the office of the Inspector-General of Police. Mr. Allmark made them over to a Mr. McKeon for experiment at his farm, some 12 miles from Toungoo. The seeds were sown on rich black cotton soil, and covered about one-fifth of an acre. They grew up exceedingly healthy and strong. The cobs were well filled and in size as large as the original American variety. The experiment was successful.
		UPPER BURMA.	
1	Pakôkku ...	.....	The seeds were distributed to the Township Officers of Yesagyo, Pakôkku, Myaing, and Seikpyu. The experiments in the Pakôkku and Myaing townships failed for want of rain, but those in Yesagyo and Seikpyu, having greater attention bestowed on them, proved successful. One hundred cobs were forwarded for inspection.

STATEMENT No. VII.—*Experimental cultivation—American maize*—concluded.

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA—concluded.	
2	Sagaing ...	Planted in different parts of the district.	The experiment failed entirely owing to insufficient rainfall during the season.
3	Ruby Mines ...	.....	The experiment was made in Mogôk, Mông Mit, and Tagaung. In Mogôk and especially in Benardmyo and places of higher altitude than Mogôk, the maize flourished, the seed returning 40 or 50 fold. In Mogôk itself it did not succeed so well. In Mông Mit the experiment appears to have been fairly successful. In Tagaung the experiment failed entirely. The American maize is much liked by the people, being sweeter than the Indian variety.
4	Shwebo ...	S. P. G. Mission Industrial Farm.	The experiment was made on land of a sandy, loamy soil in May and in due course the seeds germinated, but the severe drought that followed destroyed the young plants. In June another experiment was made and as before all perished with the exception of a few plants that managed to struggle through the drought and bore diminutive half-filled cobs. Several Burmans who were given a small quantity of maize planted near their houses, and being well watered, the plants bore three and four well filled cobs and far superior to the indigenous product, though not so large as the American variety.
5	Mandalay ...	.....	The experiment proved a failure in every township owing, in many instances to want of rain and the late receipt of the seeds.
6	Lower Chindwin ...	Distributed to Subdivisional and Township Officers.	In the Budalin subdivision three thugyis were given four cobs each. Two of the thugyies reported that they sowed the seed in alluvial land, but the experiments failed owing to drought. The third reported that his experiment was a complete success. This was due to sowing on lower lands where there was more water. In the Paiè subdivision the experiment failed in every case. The Deputy Commissioner remarks that the failure of the experiment was due to want of rain.
7	Upper Chindwin ...	Distributed to the Subdivisional Officers, Mingin, Kindat, and Paungbyin.	The experiment in the Mingin subdivision failed for want of rain. In the Kindat and Paungbyin subdivisions the experiments were successful.
8	Meiktila ...	.....	The seeds were distributed to the thugyis in the Mahlaing and Wundwin townships. The Myoôks report that for want of rain the experiments failed entirely.
9	Magwe ...	Black and sandy soil, well manured, and the ground being well ploughed.	The seeds were distributed to the Subdivisional Officer, Taungdwingyi, and the Myoôks at Natmauk and Magwe, and the Superintendent of Jail at Magwe. The Subdivisional Officer, Taungdwingyi, reports that the land was prepared in the same way as is done for country maize, but none of the seed germinated. The Myoôks at Natmauk and Magwe report that about half of the seed germinated, the young plants grew to about 2 feet in height and withered away. The Superintendent of Jail reports that the yellow variety failed entirely, but the white variety germinated to the extent of 80 per cent. Two cobs grown from seed sown this year were sent for inspection.

STATEMENT No VII.—*Experimental cultivation—Tobacco.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		LOWER BURMA.	
1	Thatôn ...	.....	Deputy Commissioner, Thatôn, reports that in the Hlaingbwè and Shwegun circles of the Pa-an subdivision, the experiments were successful and the cultivators were pleased with the results. In other cases the crop was a failure. The failure was attributed chiefly to weevils.
2	Amherst (Moulmein)	Distributed in the Haungtharaw, Gyaing, Salween, Hlaingbwè, and Pagat townships through the Secretary, Agri-Horticultural Society, Moulmein.	The experiment proved a failure in several cases owing to the unusual heavy showers at the end of October, which entirely destroyed the seedlings.
3	Mergui ...	Distributed to the Subdivisional Officer, Maliwun, and the Township Officer, Tenasserim.	The Subdivisional Officer, Maliwun, reports that the experiment was tried in a number of villages, but not a single seed germinated. The cultivators and the late Mr. Merrifield are of opinion that the soil is not suitable for cultivation of this kind of tobacco and also report that the seed was old and unfit for experimental cultivation. The Township Officer, Tenasserim, reports that the experiment was a total failure. In some cases the plants grew up and bore extraordinarily large leaves but not being able to bear the heavy strain, broke down.
		UPPER BURMA.	
1	Magwe ...	.....	The seeds were distributed to the Township Officers, Magwe, Natmauk, and Yenangyaung. None of the seeds except that sent to Yenangyaung germinated. In Yenangyaung the plants, when about 9 inches high, rotted off.
2	Mandalay ...	Distributed to all Township Officers.	The experiment in every instance proved a failure owing to want of rain and the late sowing. In the Madaya township the crop was destroyed by floods.
3	Shwebo ...	S. P. G. Mission Industrial Farm.	Owing to exposure to the air and to damp the seed turned out a failure, not a single seed sprouting.
4	Do. ...	Distributed to cultivators...	The experiment was partially successful. The cultivator to whom the seed was given for experiment ascribes this result to his having received the seed too late. About half of it grew well and the leaves have been sun-dried and kept for making cheroots. A small quantity of tobacco was sent for inspection. The sample leaves are very small and unsuitable for the market.
5	Lower Chindwin ...	Distributed to cultivators...	The experiment was a total failure except in one instance in which half an ounce of the seed sown returned 3·65 lbs. of tobacco as the result. The failure is attributed partly to drought and partly to the seed being too old: in many cases the seed sown did not even germinate.
6	Sagaing ...	.....	The Deputy Commissioner, Sagaing, reports that the Virginia tobacco seeds germinated freely and the young plants were doing well, but owing to the scarcity of rain they withered, and the experiment was a failure.
	Meiktila ...	Distributed to circle thugyis in the Meiktila, Thazi, Mahlaing, and Wundwin townships.	The Township Officers, Meiktila, Thazi and Mahlaing, report that the experiment failed in their townships for want of rain. In the Imyin and Pyaswè circles of the Wundwin township the seeds sown came up to 10 inches and 1 foot in height, and the experiment was quite a success, the tobacco obtained being saleable.

STATEMENT NO. VII.—*Experimental cultivation—Tobacco*—concluded.

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA—concluded.	
8	Pakôkku ...	Distributed to the Chindaung and Kunywa thugyis and the Myoôk of Yesagyo.	The Deputy Commissioner reports that owing to want of supervision the experiment made by the Chindaung thugyi failed. The seed given to the Kunywa thugyi was sown in rich alluvial lands, such as is usually sown with tobacco, peas, &c., but the young plants were destroyed by inundation. Such of the plants as were saved, however, grew up. A few sample leaves were sent for inspection. The leaves were smaller than that of the indigenous variety. The Deputy Commissioner remarks that this tobacco is not liked by the natives, but it appears to be of good quality and has a good aroma.

STATEMENT NO. VIII.—*Experimental cultivation—English vegetable seeds.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA.	
1	Myitkyina ...	.....	The experiment was tried in Myitkyina and Mogaung. As usual tomatoes, turnip, beet, radish, beans, peas, salad, carrots, and knolkhol came out well, but cabbages of all kinds have again proved a failure.
2	Katha	Distributed to the Subdivisional Officers, Kawlin, Banmauk, and the Battalion Commandant, Katha.	The seeds sown in Wuntho, except cauliflower, water-melon and strawberry, yielded very satisfactory results. The water-melon seed was sown in soil unsuited to its growth and sufficient care was not bestowed on the cauliflower. In Katha and Banmauk the experiments were successful.
3	Ruby Mines ...	.....	The experimental cultivation of English vegetable seeds in the Ruby Mines district has proved successful in every way. Peas, beans, &c., were extraordinarily good. The people of Mogôk are rapidly taking to growing English vegetable seeds.
4	Shwebo ...	Distributed to Subdivisional Officers, Superintendent of Jail, and the S. P. G. Mission Farm.	Ordinary classes of vegetable seeds, such as tomatoes, cabbage, lettuce, peas, beans, beet, celery, and onion succeeded fairly, strawberry failed entirely. The Deputy Commissioner remarked that on the whole the experiment was more successful than that of the previous year.
5	Sagaing ...	.....	Of the different varieties of English vegetable seeds supplied asparagus, broccoli, and water-melon failed, the other seeds being successful. The Settlement Officer, Sagaing, is the only officer who has submitted a detailed report of his experiment. The sowings were made late in the year, and, the unusual hot weather accounts for most of the failures.
6	Lower Chindwin ...	Distributed to the cultivators in the Budalin and Palè subdivisions.	The experiment was tried in both subdivisions. The experiment in the Palè subdivision failed entirely. The seeds sown in Budalin subdivision, except asparagus, tomato, broccoli, peas, beans, water-melon and onions, turned out very well. Asparagus, broccoli, water-melon, and onions were damaged by insects.

STATEMENT No. IX.—*Experimental cultivation—Jute.*

No.	District.	Particulars regarding experiment.	Result of experiment.
			LOWER BURMA.
1	Tharrawaddy ...	.....	Jute seed was distributed among cultivators and others. No one except Father Perroi, of Thónzè, tried planting any seed. From the result of Father Perroi's experiment it is clear that the cultivation of jute would have been most successful had not the condition of the seed been bad.
2	Bassein ...	.....	The Subdivisional Officer, Ngathainggyaung, distributed the seed among cultivators, and reports that the experiment was a failure, as the growing of jute was new to the cultivators.
3	Myaungmya ...	Distributed to the Subdivisional Officer, Wakèma.	The Subdivisional Officer, Wakèma, reports that the jute seed was distributed to a few cultivators in his subdivision for experiment. The seed germinated and the young plants grew to a height of a cubit and then withered away. The cultivators to whom the seed was given did not take sufficient interest in the experiment.
4	Amherst ...	.....	The Extra Assistant Commissioner, Bilugyun, who distributed some jute seed among a few cultivators, reports that many of the young plants died, a few grew up, but their stalks were not thick and strong, although they flowered and produced a seed capsule. A specimen of the plant was forwarded for inspection. The Extra Assistant Commissioner has kept some of the seed for next season.
5	Tavoy ...	Distributed to the Township Officers in the district.	The Deputy Commissioner, Tavoy, reports a complete failure owing to the heavy rainfall at the time of the experiment.
6	Mergui ...	.....	The Deputy Commissioner, Mergui, reports that the cultivation of jute requires a great deal of labour, and as cooly labour is not easily procurable there is no one enterprising enough to undertake the experiment: the general opinion is that it would not pay to do so.
			UPPER BURMA.
1	Shwebo ...	S. P. G. Mission, Industrial Farm.	In May 1895 a piece of land of a clayey, loamy nature was sown with 4 lbs. of the seed, but the hot and dry weather coming on just after it was put in the ground caused the soil to harden, and water not being available for irrigation the seed perished. Another experiment on a larger scale was tried at the end of May in a sandy soil that had been deeply ploughed, heavily manured, and left fallow the previous year, but in this case none of the seed germinated owing to the severe drought that set in after the seeds had been sown. The climatic conditions of the year have not been favourable for an experiment in jute. A different result would have been obtained if it had been possible to irrigate the field sown with jute.

STATEMENT NO. X.—*Experimental cultivation—Hemp.*

No.	District.	Particulars regarding experiment.	Result of experiment.
			LOWER BURMA.
1	Pegu ...	Experiment made by Manager, Kyauktaga Grant.	The Manager of the Kyauktaga Grant reports that the hemp seed planted last year gave great satisfaction, and has again been planted this year. It does not however grow so well as the Indian hemp.
2	Salween ...	Experiment made in the Kawyaget, Lomate, Kyauknyat, and Kawludo circles.	The experiment has not been successful, as the Karens do not understand the cultivation of hemp.
3	Amherst ...	.....	The Extra Assistant Commissioner, Bilugyun, distributed some hemp seed among cultivators in two circles of his township. Owing to the seed being old, the result was a failure.
4	Mergui ...	.....	The Deputy Commissioner, Mergui, reports that the experimental cultivation was a complete failure. In a few cases the seed germinated, but the young plants drooped and died. The Deputy Commissioner attributes the failure to the seed being old.
5	Akyab ...	Planted in virgin soil and sown broadcast.	The seed was supplied to the cultivators in the Minbya, Kaladan, and Myohaung townships. In the Minbya and Kaladan townships the seed did not even germinate. In the Myohaung township all the circles, excepting that of Yanchaung, more or less, produce some quantity of local hemp, yet in these circles the result of the experimental cultivation was a failure.

STATEMENT NO. XI.—*Experimental cultivation—Gram.*

No.	District.	Particulars regarding experiment.	Result of experiment.
			UPPER BURMA.
1	Ruby Mines ...	Distributed to several cultivators by the Assistant Commissioner, Mông Mit.	The experiment was made on a soil known as [illegible] and the result was a success everywhere. The crop gathered has been kept for seed. A small sample of the crop was forwarded for inspection. The Deputy Commissioner remarks that the crop was clean, sound, and sweet.

STATEMENT No. XII.—*Experimental cultivation—Wheat.*

No.	District.	Particulars regarding experiment.	Result of experiment.
			UPPER BURMA.
1	Ruby Mines ...	.....	The Deputy Commissioner reports that the wheat sown in Mông Mit was damaged by the heavy rains in January. It was sown early in December. A specimen of the crop was forwarded for inspection. The grains were not so well formed and smaller than the Sagaing wheat.
2	Chin Hills (Falam).	Distributed through the Political Officer.	Reports that the seed was much delayed *en route* and the greater portion on arrival damaged by weevils. A portion of the seed was planted at Haka garden and the remainder was distributed to the Haka and Klang Klang Chiefs. The experiment at Haka garden, which is irrigated artificially, resulted satisfactorily, but the experiment made by the Chins was not successful, as the season was far advanced and the heavy rain washed away the seed.

STATEMENT No. XIII.—*Experimental cultivation.—Potatoes.*

No.	District.	Particulars regarding experiment.	Result of experiment.
			UPPER BURMA.
1	Chin Hills (Falam).	Distributed through the Political Officer.	The experiments were made at Haka and Falam. Some seed was distributed among Haka Chiefs. The experiment at Haka was successful; but at Falam the seed was totally destroyed by red ants. The Chins cultivated with some success and are eager to introduce the cultivation more generally. The English red field potatoes would be the most suitable for the soil and climate of the hills.
2	Lower Chindwin ...	Distributed to the cultivators in the Budalin and Paiê subdivisions.	The experiment was tried in both subdivisions. The experiment in the Paiê subdivision failed entirely.

APPENDIX E.

STATEMENT No. XIV.—*Agricultural Shows.—Prize List.*

Name of exhibits.	Prizes.																	Remarks.
	Moulmein.			*Letpadan.*					*Henzada.*		*Myinmu.*			*Kyaungdawya.*				
	First.	Second.	Third.	First.	Second.	Third.	Special.	Certificate.	First.	Second.	First.	Second.	Third.	First.	Second.	Special.	Certificate.	
Class (i).—*Cattle.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
1. Best pair of buffaloes ...	30	...	...	...	...	...	...	...	20	10	20	20*	...	20	10	...	1	*Two of Rs. 10 each.
2. Best pair of plough bullocks	30	15	10	25	25	15	...	3	...	...	20	10	...	20	10	5	1	
3. Best pair of draught bullocks	...	...	...	...	...	...	...	...	20	10	20	10	5	20	10	5	1	
4. Best pair of bull buffaloes	...	...	...	15	...	...	...	2	10	...	...	...	...	...	...	...	...	
5. Best pair of cow buffaloes	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
6. Best bullock (cart or other)	...	...	...	20	15	10	...	2	...	...	10	5	...	...	...	...	...	
7. Best bull	20	...	...	10	10	...	...	2	10	...	10	5	...	20	10	...	1	
8. Best milch cow ...	20	10	...	15	5	...	...	2	15	10	10	5	...	20	...	...	1	
9. Best milch goat ...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...	
10. Best cow and calf ...	20	...	...	10	5	...	...	2	...	...	...	...	...	...	...	...	...	
11. Best cow with litter ...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	
Class (ii).—*Ponies.*																		
12. Best half-bred stallion ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
13. Best Burman stallion ...	...	...	...	...	...	...	...	...	...	...	10	...	...	20	10	...	1	
14. Best Burman or Shan gelding	...	...	...	...	...	...	...	...	5	...	10	5	...	20	10	15†	2	†Three of Rs. 5 each.
15. Best Burman brood mare and foal...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	10	1	
16. Best Burman foal ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Class (iii).—*Other animals.*																		
17. Best sow with litter ...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	
18. Best boar ...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	
19. Best English pigs ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Class (iv).—*Poultry.*																		
20. Best turkeys ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
21. Best flock of geese ...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...	
22. Best pair of geese ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
23. Best pair of fowls ...	5	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	
24. Best cock or hen ...	...	...	...	5	3	2	...	1	5‡	...	...	...	...	...	...	...	...	
25. Best duck or drake ...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...	‡Paid by the Deputy Commissioner.
26. Best collection of fowls...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
27. Best collection of poultry ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
28. Best brood of chickens ...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	10§	3	§Two of Rs. 5 each.
29. Best hen with chickens...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	
Class (v).—*Staple and other foods.*																		
30. Best sample of rice (assorted)	...	...	...	10	5	3	...	2	...	...	10	5	...	...	...	...	...	
31. Best sample of paddy (assorted)	...	...	...	...	...	...	...	...	10	5	10	5	...	...	...	...	...	
2. Best kyaukkyi paddy ...	10	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
33. Best yahaing... ...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
34. Best shangale ...	10	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
35. Best wheat	...	...	...	...	...	...	10(a)	1	...	...	10	5	...	...	...	...	...	(a) Paid by the Deputy Commissioner.
36. Best Indian-corn (pyaungbu)	...	...	...	5	...	...	...	1	5	...	10	5	...	...	...	...	...	
37. Best millet	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	
38. Best peas	...	...	...	...	...	...	2(b)	...	10	5	10	...	...	...	...	...	...	(b) Paid by the Doctor.
39. Best gram	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
40. Best kyaungtaga sugar...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	
41. Best chillies	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	
42. Best tilseed(sessamum)	5	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	
43. Best beans	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	

Class (vi).—*Fruits.*																	
44. Best bundle of plantains ...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...
45. Best oranges ...	10	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
46. Best cluster of cocoanuts ...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...
47. Best cluster of betelnuts ...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
48. Best collection of garden fruits ...	...	...	...	...	...	...	...	...	...	...	10	...	...	15	...	...	1
49. Best melons ...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...
Class (vii).—*Vegetables.*																	
50. Best pumpkins and gourds ...	...	...	...	3	2	...	...	...	5	...	...	...	...	...	...	...	...
51. Best yams and sweet potatoes ...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...
52. Best tomatoes and brinjals ...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...
53. Best red onions ...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
54. Best collection of country vegetables.	20	...	...	...	...	...	...	...	...	...	5	...	...	20	5	...	1
55. Best collection of English vegetables.	...	...	...	...	...	...	...	...	5	...	5	...	...	...	...	...	1
56. Best potatoes ...	...	...	...	...	...	...	...	...	5(c)	...	...	...	...	...	...	5	1
Class (viii).—*Other agricultural produce.*																	
57. Best fruit, garden ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
58. Best vegetable, garden ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
59. Best tobacco leaf (cured) ...	10	...	...	5	...	...	...	1	10	5	10	...	...	...	...	...	...
60. Best cheroots ...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...
61. Best nutmegs (locally grown)	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
62. Best cloves (locally grown) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
63. Best pepper (locally grown) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
64. Best exhibit of produce raised from Government seeds.	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...
65. Best sugarcane ...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...
Class (ix).—*Raw materials.*																	
66. Best uncleaned cotton ...	...	...	...	...	...	...	...	...	...	...	10	5	...	...	...	...	...
67. Best hemp jute ...	...	...	...	...	...	...	10(d)	1	...	...	...	...	...	...	...	...	...
Class (x).—*Forest produce.*																	
Nil.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Class (xi).—*Agricultural implements, &c.*																	
68. Best set of agricultural implements	...	...	...	...	...	...	...	...	...	...	10	5	...	15	...	...	1
69. Best plough or harrow ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...
70. Best bamboo work ...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...
71. Best Burman bullock-cart ...	...	...	...	...	...	...	...	...	...	...	...	...	...	20	5	...	1
72. Best straw stack ...	...	...	...	5	3	2	...	1	...	...	...	...	...	...	...	...	...
73. Best cattle-shed (with trough) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	15	5	...	1
74. Best set of fishing implements ...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...
Class (xii).—*Irrigation works.*																	
75. Best well, 25 feet or more ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
76. Best earth-bund for storing water...	...	...	...	15	10	5	...	2	...	...	...	...	...	...	...	...	...
77. Best water lift ...	...	...	...	...	...	...	...	...	...	...	...	...	...	20	...	...	1
Miscellaneous.																	
78. Best mats (thinbyu) ...	...	...	...	3	2	...	...	...	...	...	...	...	...	...	...	...	...
79. Best silver work ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
80. Best country made pottery ...	...	...	...	10	...	...	...	2	...	...	10	...	...	...	...	...	...
81. Weaving and embroidery ...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...
Total prizes ...	235	44	10	200	88	37	22	32	202	45	240	90	5	240	80	55	18
Contingencies ...	185-3-0			...					48		370-12-0(e)			25			
Grand Total ...	289+185-3-0=474-3-0			347+0=347					247+48=295		335+370-12-0=705-12-0			375+25=400			

(c) Paid by the Deputy Commissioner.

(d) Paid by the Deputy Commissioner.

(e) Partly met from private subscription.

APPENDIX F.

STATEMENT XV.—*Annual Famine Statement C for Burma for the year 1896-97.*

Division.	District.	Population.	Maximum number of persons for whom relief may be required daily in the event of serious famine.	Number of persons provided for by relief works on the programme daily for three months. Large works. Sanctioned.	Large works. Not sanctioned.	Small works. For relief of agricultural population in neighbourhood of villages.	Small works. Others.	Remarks.
1	2	3	4	5	6	7	8	9
ARAKAN ...	Sandoway	78,425	3,000	...	6,000	...	...	The works, which consists of roads, are of public utility and can be completed within the period of scarcity.
PEGU	Tharrawaddy	347,454	4,000	...	7,000	13,000	...	The utility of the works, which consists of roads, irrigation, and miscellaneous works, has been certified by the Deputy Commissioner, and they can be finished within the period of scarcity.
	Prome	360,252	10,000	2,000	6,000	13,000	...	Includes roads and irrigation projects and can be completed within the period of scarcity.
NORTHERN	Mandalay	374,060	15,000	...	45,000	5,000	...	The works consist of nine roads for opening out communications. There are three irrigation works which would bring considerable areas under cultivation. All useful works recommended by the Public Works Department, and might be finished within six months.
	Bhamo	93,260	5,000	...	67,000	3,000	1,000	These works, which consist of roads, are of public utility and can be finished within the period of scarcity if sufficient high rates are given.
	Katha	139,636	5,000	...	20,000	4,000	...	All useful works, comprising roads and irrigation schemes, can be completed within the period of scarcity.
	Ruby Mines	34,062	2,000	2,000	6,000	1,000	...	None of the works are likely to be completed within the period of scarcity except the minor irrigation works.
CENTRAL	Shwebo	330,779	45,000	3,000	36,000	10,000	...	Includes roads, tanks, embankments, and wells. These works have been certified by the Deputy Commissioner and might be finished within six months.
	Sagaing	247,136	20,000	4,000	34,000	2,000	...	Roads and irrigation works, comprising construction and repairs to tanks, canals, &c. These have been certified as useful by the Executive Engineer and can be completed within the period of scarcity.
	Lower Chindwin	233,316	30,000	17,000	59,000	13,000	...	Comprising roads and tanks; most of these works might be completed within six months.
	Upper Chindwin	110,016	7,000	...	10,000	4,000	...	The utility of the works, which consist of roads, has been certified by the Deputy Commissioner, and they can be completed within the period of scarcity.
SOUTHERN	Thayetmyo	250,161	13,000	1,000	21,000	4,000	...	The utility of these works, which consists of roads and irrigation projects, has been certified by the Executive Engineer and they can be completed within the period of scarcity.
	Pakôkku	315,827	30,000	3,000	46,000	12,000	...	Roads and irrigation works, which can be completed within the period of scarcity.
	Minbu	212,401	15,000	...	24,000	1,000	4,000	The works, which consists of roads and irrigation projects, have been certified as useful by the Executive Engineer and they can be completed within the period of scarcity.
	Magwe	219,190	20,000	...	28,000	12,000	...	The utility of these works, which consist of roads and irrigation projects, has been certified by the Executive Engineer, and they can be completed within the period of scarcity.
EASTERN	Meiktila	206,650	20,000	2,000	33,000	6,000	...	The works include roads and irrigation projects, and they can be completed within or soon after the period of scarcity.
	Yamèthin	217,011	20,000	4,000	24,000	12,000	...	The works come under two heads: Communications and Irrigation. As the works would only be undertaken in proportion to the applicants for employment, they should be completed within the period of scarcity.
	Myingyan	351,411	10,000	4,000	9,000	8,000	...	The utility of the works, which consist of roads and irrigation projects, has been certified by the Deputy Commissioner and Executive Engineer. Most of the works can be completed within the period of scarcity.
	Total ...	4,021,937	274,000	43,000	461,000	123,000	5,000	

G. B. C. P. O.—No. 5409, D., L. R. & A., 14-1-96—235.

LAKHIMPUR
TEZPUR
NOWGONG
TOKIMA
SYLHET
NORTH LUSHAI HILLS
OHIN HILLS

Map
OF
BURMA
ILLUSTRATING
THE ANALYSIS OF DISTRICTS WITH REFERENCE
TO SECURITY AGAINST FAMINE.
1895-96.
SCALE: 1 INCH = 32 MILES.
REFERENCES.
LOWER CHINDWIN
MANDALAY
SOUTH SHAN STATES
SIAMESE SHAN STATES
BAY OF BENGAL
GULF OF MARTABAN
SOUTH LUSHAI HILLS
ARAKAN HILL TRACTS
AKYAB
PYINMANA
PAPUN
TAUNGGYI
MOKMAI
KAYENGHAI
KYENG HUNG
MYINGYAN
MEIKTILA
WAMBTEIN
TAUNGGYI
TOUNGOO
HANGDON
AMHERST
TEATON
SAPOGWAY
KIRUMPUR
MYEDAGO
SAGAING
MUNGSINGHAI
MUNGSINGHAI
SIMNE
LAKE

Map
OF
BURMA
ILLUSTRATING
THE ANALYSIS OF DISTRICTS WITH REFERENCE
TO SECURITY AGAINST FAMINE.
1895-96.
SCALE: 1 INCH = 32 MILES.
REFERENCES.
District boundaries
Tract A secure against famine
Tract B partially secure against famine
Tract C insecure from famine
Railway line opened
Railway line under construction
ANDAMAN
ISLANDS
MERGUI
ARCHIPELAGO
MALAY PENINSULA
GULF OF SIAM
MARTABAN
MERGUI
ARCHIPELAGO
GULF OF SIAM

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1896-97.

RANGOON: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, BURMA. NOVEMBER 1897.

[Price,—Re. 1-0-0.]

TABLE OF CONTENTS.

REPORT ON THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BURMA, FOR THE YEAR 1896-97.

SECTION I.

Prefatory.

	Para.	Page.
Service of officers	1	1
Tours of Director	2	ib.

SECTION II.

Land Records Establishments.

Changes affecting the department	3	2
Educational qualification for admission to survey schools	4	ib.

SECTION III.

Utilization of Land Records.

Upkeep of township books in all districts under supplementary survey	5	2

SECTION IV.

Scientific and National Enquiry under Imperial Control.

Co-operation of the department with minor departments	6	2
Collection of economic products	7	3
Works of the Civil Veterinary Department	8	ib.
Registration of trade between Upper and Lower Burma	9	4
Compilation of quinquennial crop-cutting report	10	6

SECTION V.

Scientific and Local Enquiry under Provincial Direction.

Remarks on agricultural products	11	6
Experimental cultivation in the Southern Shan States	12	ib.
Distribution of seeds	13	7

SECTION VI.

Agricultural Education.

Educational requirements for admission to survey schools	14	7

SECTION VII.

Publication of Agricultural information.

Upkeep of township books	15	7
Papers not communicated to other provincial departments	16	8

SECTION VIII.

Final.

Matters dealt with by Director	17	8

APPENDICES.

	Page.
Appendix A.—Report on experimental cultivation in the Southern Shan States for the year 1896-97	iii.
Statement No. I.—Actual total receipts and disbursements from the 1st June 1896 to 31st May 1897 (year under report)	xi.
Statement No. II.—Details of disbursements from the 1st June 1896 to 31st May 1897 ...	ib.
List of fruit trees in orchard, 1896—Apples	xii.
Statement No. III.—Distribution list of seed obtained for experimental cultivation during 1896-97	xviii.
Statement No. IV.—Description of seeds received, together with the cost of consignment and of distribution during 1896-97	xix.
Statement No. V.—Experimental cultivation—American maize	ib.
Statement No. VI.—Experimental cultivation—Tobacco	xxi.
Statement No. VII.—Experimental cultivation—English vegetable seed	xxii.
Statement No. VIII.—Experimental cultivation—Wheat	ib.
Statement No. IX.—Experimental cultivation—Gram	xxiii.
Statement No. X.—Experimental cultivation—Potatoes	ib.
Statement No. XI.—Experimental cultivation—Oats	ib.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1896-97.

SECTION I.

PREFATORY.

MR. T. C. WILSON, I.C.S., held charge of the Department of Land Records and Agriculture throughout the year with the exception of a period of 3½ months, July—November 1896, when he officiated as Revenue Secretary. During this period of deputation Mr. A. Gaitskell, I.C.S., Settlement Officer, Amherst and Thatôn districts, officiated as Director.

Mr. J. C. Clancey, Superintendent, 1st grade, and Assistant to the Director, proceeded on furlough on 21st June 1896 and was succeeded by Mr. R. A. Gibson, Superintendent, 2nd grade.

Mr. T. S. Thisselle, Superintendent, 5th grade, Myaungmya, died on 18th May 1896.

Maung Shwe Zan Aung and Maung San Shwe were confirmed as Superintendents, 5th grade, during the year.

Tours of Director.

2. In August 1896 Mr. Gaitskell, Officiating Director, visited the districts of Meiktila, Yamèthin and Myingyan in which scarcity was impending, and visited the test relief works which had just been started with the view of seeing whether the tasks exacted at the works were really adequate and of reporting generally on the situation. He submitted a report to the Financial Commissioner. During September 1896 he inspected the Supplementary Survey offices at Mandalay, Prome, and Pegu.

In November and December the Director, Mr. Wilson, toured through the Sagaing and Minbu districts, in the former district in company with the Settlement Officer, and in the latter district in company with the Settlement Officer and the Senior Assistant Settlement Officer. During these tours the work both of settlement and supplementary survey (which is being carried on simultaneously with settlement) was inspected. At the close of the tour a report on the results of the inspection, together with proposals for future procedure in connection both with settlement and supplementary survey, was submitted for the orders of the local Government. After leaving Minbu district the Director visited Thayetmyo, in accordance with orders received from the Chief Commissioner directing the submission of a report on the method of assessment of *ya* lands in the Thayetmyo district. The *ya* lands in question were inspected and a report submitted through the Financial Commissioner to the local Government.

In February 1897 the Director visited the Meiktila district and in company with the Settlement Officer checked soil-classification work, which was undertaken for the first time during the year, over a considerable area. In January 1897 the Director visited the Thatôn district with the object of inspecting settlement work generally in that district and particularly the fertile sugarcane lands in Bilin, where sugarcane of excellent quality is grown on alluvial soil without irrigation. During the month of March 1897 the Director inspected Supplementary Survey field-work, and the offices and survey schools in the districts of Thôngwa, Myaungmya and Bassein. The Assistant to the Director during the year checked Supplementary Survey work in the districts of Shwebo, Kyauksè, Thayetmyo, Amherst, Thatôn, Tavoy, Mergui, Pegu, Hanthawaddy, Tharrawaddy, Prome, Henzada, Kyaukpyu and Sandoway. Akyab was the only district unvisited during the year.

SECTION II.

LAND RECORDS ESTABLISHMENTS.

3. This subject is dealt with in detail in the Revenue Administration Report. The principal changes affecting the department during the year were the subdivision of the Mandalay-Kyauksè charge, which had hitherto been held by one Superintendent, into two independent charges, and the obtaining of sanction to a like subdivision in the case of the Amherst-Thatôn charge, which has since been effected. With a view to increasing the efficiency of the revenue surveyors pupils of the Survey schools who have passed the Syndicate examination in surveying prescribed for thugyis and subordinate Land Records officers have been encouraged to join the cadastral survey parties of the Survey of India for a course of practical training in actual field-work and in future candidates for revenue surveyorships and inspectorships, who have undergone a training of the kind, will, *cæteris paribus*, be preferred to others. As a result of the agricultural conference held at Rangoon in December 1895 under the presidency of Sir Edward Buck the Director was permitted to nominate Land Records and Settlement Inspectors for appointment as Township Officers. During the year some nominations were made, but as yet none of the nominees have received an appointment.

4. The question of requiring a VII Standard educational qualification from candidates for admission to Survey schools in Burma, from which nearly all the subordinate Land Records officers are drawn, was again considered during the year. In the present state of education in Burma it is not as yet considered feasible to require this educational qualification, but with a view to the gradual raising of the standard of the educational qualification of Land Records Inspectors it has been decided that from a date in the near future (not yet fixed) the possession of the VII Standard qualification shall be obligatory before a person can be appointed an Inspector of Land Records; and as an additional inducement to candidates possessing the VII Standard qualification to join the Land Records Department, the local Government has agreed to give annually one appointment as Township Officer to one Land Records Inspector among candidates recommended by the Director.

SECTION III.

UTILIZATION OF LAND RECORDS.

5. In accordance with the decision arrived at by the Agricultural Conference held at Rangoon in 1895 the upkeep of township books in all districts under supplementary survey was prescribed in Financial Commissioner's Circular No. 8 of 1896. These township books correspond generally with the circle notebooks maintained in Indian provinces. During the year of report the figures of only one year could be entered in the township books, and of course neither District nor Land Records Officers were in a position to make any great use of them. They were examined by the Director in the districts visited by him and found to have been correctly prepared. The figures for a second year have now been entered and District Officers have been directed to communicate to the Director any points in them worthy of notice or calling for action. As yet no reports have been received. During the current year such examinations of the township books as have been made by the Director have disclosed the fact that their purport and the object of their upkeep has not in all cases been properly understood by the Superintendents of Land Records. The method of upkeep and the principal matters requiring notice have now been thoroughly explained to the Superintendents concerned.

SECTION IV.

SCIENTIFIC AND NATIONAL ENQUIRY UNDER IMPERIAL CONTROL.

6. Of the Imperial departments referred to in Resolution No. IV of the Government of India the Land Records Department in Burma may be said to have co-operated with the following :—

(1) The Survey Department.
(2) The Meteorological Department.

(3) The Department under the Reporter on Economic Products.
(4) The Civil Veterinary Department.
(5) The Department of Agricultural Chemistry.
(6) The Statistical Department.

Various small local surveys were carried out during the year, an account of which is given in the Revenue Administration Report. The changes which annually take place in the cadastral maps originally prepared by the Imperial Survey Department or the Provincial Survey Department are regularly transferred on to the 1-inch district map, so that if at any time a new edition of the 1-inch or 2-inch maps of the surveyed tracts in the province is contemplated by the Survey Department the necessary traces brought up to date can be at once supplied by the Land Records Department. The rainfall statistics of the province are compiled in the office of the Director of Land Records and regularly transmitted to the Meteorological Reporter to the Government of India. A separate report is written on rainfall registration and, as this has already been published, it does not appear necessary to go into details in this report.

7. The following statement gives a list of the various economic products collected for and supplied to the Reporter on Economic Products:—

Economic Products sent for the Indian Museum, Calcutta, and Imperial Institute, London.

Name.	Description of specimen sent.	Where obtained from.
Botanical.		
Acacia suma	Bark	Chindwin Forests, Upper Burma.
Ægle marmelos (Bael)	Fruits, flowers and buds ...	Amherst, Lower Burma.
Ditto ...	Gum	Sagaing, Upper Burma.
Bixa Orellana (Arnotto) ...	Pods, seeds and herbarium specimen.	Amherst, Lower Burma.
Carthamus tinctorius	Plants, flowers and seed ...	Prome, Lower Burma, Thayetmyo, Pakôkku, Minbu, Sagaing, and Kyauksè, Upper Burma.
Cassia auriculata	Bark, flowers, seed and roots ...	Pakôkku, Upper Burma.
Cordia myza	Dried fruit	Maymyo plateau, Mandalay, Upper Burma.
Flacourtia cataphracta	Seed	Tenasserim Division, Lower Burma.
Kydia calycina	Fibre, leaves and bark ...	Tenasserim Division, Lower Burma.
Maontia puya (Urticacea) ...	Fibre	Chindwin Valley, Upper Burma.
Millingtonia hortensis	Bark	Tenasserim Division, Lower Burma.
Morinda (*Al* dye)	Roots and leaves of three varieties.	Mandalay, Upper Burma.
Oriza sativa (wild species) ...	Plants and seed	Pegu, Bassein, and Thôngwa, Lower Burma.
Terminalia cheduba	Fibre	Mandalay, Upper Burma.
Mineral.		
Gold	...	Mông Mit, Northern Shan States.
Rubies, garnets, sapphires and other forms of corundum.	...	Sagyin Hills, Mandalay, Ruby Mines, Nanyazeik Mines, Myitkyina, Upper Burma.

8. A separate report on the work of the Civil Veterinary Department is written by the Superintendent, noted on by the Director, and reviewed by the local Government. This report has already been published and it is only necessary to say here that the staff of Veterinary Assistants for both Upper and Lower Burma is now nearly complete: their work in connection with cattle-disease is gradually becoming more efficient, and in some places the people are beginning to really appreciate their services. The Veterinary School continues to be maintained in Rangoon and an attempt is being made to train Shans for service as Veterinary Assistants in the Southern Shan States, but they do not make very intelligent students. As yet no pupils have been received from the Northern Shan States, though it is intended that Veterinary Assistants shall, when available, be posted to those States also. During the year specimens of soil from the Amherst district were sent for

analysis by the Settlement Officer to the Agricultural Chemist to the Government of India, and the results of the analysis were duly received.

9. The registration of the trade between Upper and Lower Burma, and of the land trade between Burma and adjacent foreign countries, was continued during the year. The annual report on the transfrontier trade has already been published, and the quarterly reports on the trade between Upper and Lower Burma were regularly published. It has now been decided to discontinue the registration of the trade between Upper and Lower Burma on the ground that the results obtained were not commensurate with the cost involved. In future, therefore, it will not be possible for this Department to give statistics of the movement of food-grains between Upper and Lower Burma. The year under report was a year of scarcity in many districts in Upper Burma, and of famine in the districts of Meiktila, Yamèthin, and Myingyan. The statement given below shows the movement in food-grains and provisions between Upper and Lower Burma during this and the preceding year :—

Statement showing the direction of trade in the principal food-grains, pulse and provisions.

Year.	Description.	Brought into Upper Burma.			Taken out of Upper Burma.			Balance.		Net total of food-grains, &c., brought into Upper Burma.	Remarks.
		From Lower Burma.	From foreign countries.	Total.	To Lower Burma.	To foreign countries.	Total.	Brought into Upper Burma.	Taken out of Upper Burma.		
		Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	
1895-96.	Wheat	86,257	...	86,257	15,344	9,956	25,300	60,957	...	...	
	Paddy	499,255	4,632	503,887	567,638	634	568,272	...	64,385	...	
	Rice	812,772	27,559	840,331	2,183	290	2,473	857,858	...	...	
	Jowar and bajra ...	...	...	...	...	...	...	...	...	...	
	Gram and pulse ...	28,604	408	29,012	541,558	572	542,130	...	513,118	...	
	Other grains and pulses	9,015	21	9,036	4,645	...	4,645	4,391	...	...	Maize, barley, and millet.
	Ghi	16,105	2	16,107	13	1,153	1,166	14,941	...	...	
	Dried fruits, vegetables and nuts.	80,801	49,983	130,784	258,094	1,667	259,761	...	128,977	...	Onions, garlic, potatoes, dates, tamarind, &c.
	Other provisions ...	722,186	110,559	832,745	47,203	68,172	115,375	717,370	...	...	Ngapi, salted or dried fish, flour, biscuits, butter, condensed milk, pickled tea, sardines, bacon, hams, &c.
	Total ...	2,254,995	193,164	2,448,159	1,436,678	82,444	1,519,122	1,635,517	706,480	929,037	
1896-97.	Wheat	26,956	...	26,956	11,410	...	11,410	15,546	...	...	
	Paddy	1,411,943	9,338	1,421,281	13,794	81	13,875	1,407,406	...	...	
	Rice	2,158,899	92,100	2,250,999	648	498	1,146	2,249,853	...	...	
	Jowar and bajra ...	...	...	...	431	...	431	...	431	...	
	Gram and pulse ...	21,626	362	21,988	607,721	823	608,544	...	586,556	...	
	Other grains and pulses	21,216	...	21,216	1,058	...	1,058	20,158	...	...	Maize, barley, and millet.
	Ghi	14,295	109	14,404	85	746	831	13,573	...	...	
	Dried fruits, vegetables and nuts.	55,637	46,855	102,492	289,101	3,091	292,192	...	189,700	...	Onions, garlic, potatoes, dates, tamarind, &c.
	Other provisions ...	659,831	106,918	766,749	49,407	11,612	61,019	705,730	...	...	Ngapi, salted or dried fish, flour, biscuits, butter, condensed milk, pickled tea, sardines, bacon, hams, &c.
	Total ...	4,370,403	255,682	4,626,085	973,655	16,851	990,506	4,412,266	776,687	3,635,579	
	Increase or decrease...	+ 2,115,408	+ 62,518	+2,177,926	− 463,023	− 65,593	− 528,616	+ 2,776,749	+ 70,207	+ 2,706,542	

10. The quinquennial crop-cutting report was compiled during the year and submitted to the Government of India. A very large number of experiments, particularly in Upper Burma, had to be rejected as untrustworthy, and certain modifications in the form at present prescribed for reporting the results of the experiments have been proposed. The usual monthly notes on the food-supply of the province have been regularly published.

SECTION V.

SCIENTIFIC AND LOCAL ENQUIRY UNDER PROVINCIAL DIRECTION.

11. There are no experimental farms under the management of the Agricultural Department in Burma and it is not thought necessary or advisable to establish any. In Lower Burma there is practically but one staple crop, rice. The soil of Lower Burma is as a general rule very fertile, and the cultivation careful; it is improbable that any useful results would be obtained from experiments in rice cultivation on an experimental farm in Lower Burma. In Upper Burma the crowning agricultural defect is want of water. At present crops fail annually over large areas from drought. The first thing to be done, therefore, with funds that may be available is to provide irrigational facilities. At present the establishment of an experimental farm would be a luxury.

Southern Shan States.

12. The experimental cultivation in the Southern Shan States was continued during the year and the Superintendent's report is given *in extenso* in the appendices. The experiments carried out by Mr. Hildebrand were chiefly in fruit culture and, so far as they have gone, they may be considered to be successful. The cultivation of wheat by the Shans continued to be fostered by the Superintendent arranging for the whole of the produce to be taken over by the Commissariat Department at a fixed rate. The crop of the year was a very good one and 600,000 lbs. of wheat were sold to the Commissariat Department and 400,000 lbs. were disposed of through the agency of the Superintendent to other purchasers. The successful growing of wheat in the Southern Shan States has now been proved to be possible, but in the present state of communication it is impossible for it to be grown at a profit to the cultivator unless it is purchased by the Commissariat Department, as the cost of the carriage to Rangoon renders its price prohibitive as an article of export for sale in the English market. At present then the area cultivated with wheat must be restricted to that which is necessary for the supply of the Commissariat Department in the Southern Shan States, but given a ready means of disposing of the produce, the area on which wheat can be successfully cultivated is said to be practically unlimited. Two cwts. of the wheat grown this year in the Shan States have been obtained at the request of one of the leading firms in Rangoon for despatch to their correspondent in London. The quality of the wheat supplied is said to be very fine, but, as before remarked, the present price at which it can be delivered in Rangoon is prohibitive for intending exporters to Europe. The principal difficulty which has arisen in connection with the wheat industry in the Shan States relates to the storage of seed wheat during the rains, and hitherto fresh seed wheat has been supplied annually from India and treated as an agricultural advance, to be recovered when the crop is reaped and sold, but Government cannot undertake the work of supplying seed as a permanency, and this year attempts have been made to preserve the seed wheat from the attacks of weevils by the use of naphthalene powder and, if this proves successful, the difficulty will be solved. There seems to be no reason, however, why the seed wheat should not be stored in pits in the same way as is done in the Central Provinces and other parts of India, and the Director of Agriculture, Central Provinces, has been asked to favour this Department with a description of the exact method of preparation of the pits and of the method of storage.

Potatoes in any quantity can be produced in the Shan States as in the case of wheat; all that is wanted is a means of conveying the produce to market at a cheap rate.

Distribution of seeds.

13. The statement in the appendices shows the seed distributed for experimental cultivation during the year. The experiments in the cultivation of maize were generally unsuccessful owing to various causes, and, as stated in last year's report, the distribution of American maize seed is to be discontinued. Accordingly no supply was obtained from America this year. The experiments with imported tobacco seeds and English vegetable seeds may be regarded as fairly satisfactory considering the agency through which they are conducted. The cultivation of groundnuts is carried on with some success in the Shan States and in parts of the Kyauksè district, and as this crop appeared to be suited to the circumstances of many of the districts of the dry zone in Upper Burma, a supply of seeds was obtained from Pondicherry and distributed to the districts noted in the margin. The crop is a hardy one, profitable, and does not require irrigation. The result of the experiment will be watched with interest as, if it is successful, large areas in Upper Burma will probably be cultivated with groundnuts.

Mandalay.	Minbu.	Shwebo.
Ruby Mine.s	Thayetmyo.	Lower Chindwin.
Bhamo.	Pakôkku.	Upper Chindwin.
Katha.	Magwe.	Meiktila.
Myitkyina.	Sagaing.	Yamèthin.
	Myingyan.	

SECTION VI.

AGRICULTURAL EDUCATION.

14. The candidate for employment in the Land Records Department in Burma usually enters it through one or other of the Survey Schools which are established in the province. The candidates who present themselves for admission to the Survey Schools have to pass a qualifying examination in reading, writing and arithmetic, and, judged by the results of these qualifying examinations at which the large majority of the candidates pass, the educational system of the province may be considered sufficient to meet the requirements of students who intend to join the Land Records Department in the lower grades. The qualifications necessary for a revenue surveyor (who corresponds nearly to the patwari of India) are a knowledge of reading, writing, arithmetic and surveying. Instruction in the three former subjects is given in the ordinary schools of the province and in the latter in the survey schools, where also arithmetic, mensuration and geometrical drawing are taught. For the revenue surveyors the educational qualifications which they as a rule at present possess appear to be sufficient. For Inspectors a somewhat higher standard is desirable, and above, in section II of this report, an account has been given of the steps which have recently been taken to induce men possessing the VII Standard qualification to join the Land Records Department. It is not necessary that Inspectors of Land Records should possess any special agricultural qualifications, and, in the present circumstances of the province, the measures which have already been taken appear to be all that are feasible or required. During the year steps have been taken to have prepared an improved text-book on agriculture for use in elementary vernacular schools. This text-book, which has been compiled by Maung Ngwe Gaing (an *ex*-member of the Land Records Department and a passed student of Cirencester College) with a chapter on cattle and veterinary matters by the Superintendent, Civil Veterinary Department, is now nearly ready for issue. Steps are also being taken by the Educational Department to include instruction in maps and land records in the curriculum of education for all classes, and no doubt the aid of the Land Records Department will be invoked in the matter.

SECTION VII.

PUBLICATION OF AGRICULTURAL INFORMATION.

15. (1) As noted above, the upkeep of township books which correspond to the district circle note-books was only prescribed during the year of report. It was therefore impossible to obtain any information regarding agricultural deterioration from them, and no communications from District Officers were received regarding them.

(2) The subject for ledgering during the year in the office of the Director was "Irrigation," but very little progress has been made with the work as there has been but little of interest on the subject in the district or settlement reports received during the year.

(3) A detailed famine analysis of the whole province, both Upper and Lower Burma, had been prepared before the commencement of the year under report. It is intended to revise this triennially except in the case of particular districts where, owing to the occurrence of scarcity or other causes, additional facts are brought to light which show that the analysis already made is defective in important points. During the year of report famine has prevailed in the Meiktila, Myingyan and Yamèthin districts, and it is probable that a revision of the analysis of these districts may be found to be necessary.

(4) No papers were contributed by the provincial Agricultural Department directly or through its agency. Various papers were contributed by Veterinary Captain Evans, A. V. D., the Superintendent of the Civil Veterinary Department, to the Agricultural Ledger, but these papers did not pass through the provincial Land Records Department.

(5) The following papers were received during the year from other provincial departments :—

(i) Note on the cultivation of rhea in Assam.

(ii) North-Western Provinces and Oudh Bulletin on a new method of tree-planting.

(iii) Madras Agricultural Bulletin on Water-lifts.

(iv) Note on the races of wheat cultivated in Bengal.

16. No papers were communicated to other provincial departments.

SECTION VIII.

FINAL.

17. The Director in Burma deals with the following matters :—

(1) Supplementary survey.
(2) Settlement.
(3) Trade registration.
(4) Rainfall registration.
(5) Famine.
(6) Civil Veterinary Department.
(7) Weekly crop reports.
(8) Survey schools.
(9) Crop-cutting experiments.
(10) Rice crop forecasts.

There are now 16 districts in Lower Burma and eight districts or parts of districts in Upper Burma under supplementary survey. There are four districts under settlement in Lower Burma, and *quasi*-settlement work is shortly to commence in three more, while in Upper Burma three districts are under settlement and a tenure enquiry is being held in a fourth. The area to be travelled over is very large and even with the assistance of the Assistant to the Director it becomes increasingly difficult to arrange for the proper conduct of the heavy office work combined with an adequate amount of field inspection.

The forecasts of the exportable surplus of the rice crop were issued as usual during the year. These forecasts are eagerly looked forward to and to a considerable extent trusted in by the mercantile community in Burma, as experience has shown that as a rule they may for all practical purposes be taken to be correct. During the past year, as an additional means of ensuring accuracy in the estimate, the weights of the paddy per basket received at the mills in Rangoon were obtained at different times during the season from the principal exporting firms, and during the present year it is intended to obtain the same information from the representatives of the firms at Bassein, Akyab, and Moulmein. The exportable sur-

plus was estimated at 1,700,000 tons of cargo rice and, as far as present indications show, it is probable that the actual amount exported will be between 1,600,000 tons and 1,700,000 tons.

T. C. WILSON,
Director of the Department of Land Records and Agriculture.

RANGOON:
The 1st October 1897.

APPENDICES.

APPENDIX A.

REPORT ON EXPERIMENTAL CULTIVATION IN THE SOUTHERN SHAN STATES FOR THE YEAR 1896-97.

THIS is the sixth annual report and is for the period 1st June 1896 to 31st May 1897.

2. *Grant.*—The grant for the year was Rs. 6,500, or Rs. 800 in excess of last year.

3. *Expenditure.*—The expenses for the year also show a slight excess, namely, Rs. 6,676-8-2 against Rs. 6,538-13-8 for last year, the excess being Rs. 137-10-6. The details of expenditure will be found in Statement B annexed.

Receipts.—The receipts from sales have fallen short of last year as far as the actual credits to the treasury are concerned within the year, but there has been a further sum of from Rs. 1,000 to Rs. 1,500 earned under the heading of "wheat" which has not as yet been credited, as the wheat crop has not as yet all been sold. The total receipts last year were Rs 5,249-13-7 and this year Rs 4,558-14-11, a falling off of Rs. 690-14-8.

When the earned, but not as yet credited, payments for wheat are credited, the receipts for the year, even if Rs 1,000 only is credited, will be Rs. 5,558-14-11, or within Rs. 1,000 of the total allotment. Statement A annexed will give the exact receipts credited in the treasury to date under the main heads, and also the total expenditure, and Statement B will give the details of expenditure—debited under the several major heads from the two grants drawn upon, namely, the grant for 1896-97 and 1897-98. Statement C will give the expenditure deducting the actual receipts, *plus* Rs. 1,000 of the further receipts anticipated, the total cost of experimental cultivation for the year to Government will be under Rs. 1,000 and for this the following work has been done.

4. *Work for the year.*—The fence round the 41 acres of orchard has been kept well clipped back and it forms a most impenetrable fence. In the place of the old bamboo bars which acted as gates good substantial teak gates and gate posts have been substituted and painted green. All capital expenditure therefore on fencing has been disbursed, and any repairs or work on it for the next 20 years will be done by the garden establishment.

The pruning and mulching of the older trees in the old orchard has been carefully attended to. The budding and grafting on to indigenous stock of apples, pears, peaches, apricots, plums, and cherries, has been carefully carried out and completed. Nurseries have been maintained for the supply of all indigenous stock, as well as for the growth of young trees for roadside planting.

A large quantity of plantain trees, that had been grown for shade between the fruit trees in the old orchard, and which had grown too large and gave too much shade, have been grubbed up and apple and pear stock planted in their place.

The potatoes put in between the trees last year have been dug and sold. A further cold weather crop for seed has also been sown and dug, and some 16 acres are now under potatoes for this rain's crop. A change of potato seed has been imported from India at a very heavy cost and has germinated well.

The vegetable garden has been kept going throughout the year at great trouble, as the gardener has twice had to be removed and renewed. There is, however, a good stock of all sorts of vegetables in the garden.

The trees planted in the Government compounds and on the roadsides in the Taunggyi civil station have been fostered and all vacancies renewed.

Six lakhs of pounds of wheat have been grown outside the limits of the orchard by local cultivators from seed supplied by me. This has been purchased by the Chief Commissariat Officer, Fort Stedman There is still a balance of some four lakhs of pounds to be disposed of in the hands of the cultivators.

The cultivation of flowers has also been extended and this year, besides giving away large quantities of geranium, rose, and chrysanthemum plants, a commencement has been made in the growth of varieties of European violets and begonia, narcissus, and other bulbs.

5. *General remarks.*—The principle of employing local labour only has been strictly adhered to, and as far as possible the employment of casual labourers among the fruit trees has been avoided. There are certain seasons of the year, however, when the regular establishment is quite unable to cope with the requirements, and then gangs of casual labourers have to be called in.

6. *Establishment.*—Mr. Colyear, the head gardener on Rs. 150 per mensem, remained till the end of the financial year, 31st March 1897. He then was permitted to retire as I thought I could manage without him and so save about half of the total expenses of labour. Since he has gone Maung Sè, who is now head gardener, has carried on the work in a most satisfactory manner. His pay has been raised from Rs. 30 to 40 a month, and one of the clerks of my office, Maung Bwa, who has always shown a considerable interest in the work, has been granted an allowance of Rs. 10 a month to do the labelling, registration, and

English writing. In this one item there is therefore a saving of Rs. 130 per mensem and the work goes on no worse, if not immensely better and more satisfactorily, than before.

Maung Saye has shown his usual assiduity and willingness to assist, and, wet or dry, when not engaged in the office, he is seldom off duty of some sort in the orchard or among the roadside trees.

Maung Po Mya has continued to earn his reputation as my right hand in encouraging the growth of wheat. He has certainly earned his character of being a most trustworthy and able assistant during the past year and has done wonders in consequence in promoting the wheat trade.

The experiment of raising the pay of the under gardeners and of grading them has had a most excellent effect. There are now two men of over two years' service who are becoming quite handy gardeners, and there are two more who allow of hopes that they will also remain on permanently and become handy men. No one who has not had a garden and orchard of this nature to "run" can appreciate what this means, not only in mental wear and tear for me, but in actual wear and tear among the plants. The present establishment arrangements are eminently cheap and, as such, satisfactory.

7. *Vegetable Gardens.*—As mentioned last year, the subscription rate was raised from Rs. 3 per mensem per household supplied to Rs. 4 per mensem. With this increase of rate there has also been an increase of subscribers and consequently of houses supplied, until I have had to refuse some applicants as the supply was insufficient.

In August and September when the rain is constant and the soil gets water-logged the supply was scant in the matter of variety, but by growing on a hill slope at that time of the year I managed to keep things going.

At most seasons there is an abundance of all sorts of vegetables. The asparagus beds made in 1891-92 are showing signs of requiring renewal as the sprouts are getting deficient in size.

The total expenditure on the garden has been Rs. 211-7-9 and the receipts Rs. 292-2-9, which gives a margin of profit of Rs. 80-11-0.

8. *Wheat.*—No wheat has been grown directly by me during the year. One and a half lakhs of pounds of seed wheat was imported from India at a cost of Rs. 13,192-11-2 and distributed. The crop was a much better one than was ever realized before as there was no rain from November till the wheat was harvested in April and May to create rust, which has caused much damage in former years. The crop was not only a good one, but the sample of grain was excellent, and the Commissariat Department at once took over the six lakhs of pounds they had guaranteed to take at Fort Stedman. They could not take more, however, and it is estimated that there are now some four lakhs of pounds remaining in the hands of the cultivators. This I am endeavouring to sell for them, but so far have not succeeded.

The Commissariat were supplied at Rs. 6-8-0 per 105 lbs. The highest bid I have so far got for the balance is Rs. 4-8-0 by a contractor who is supplying wheat to the Mandalay Commissariat at Rs. 7-4-0.

It seems a pity that the Commissariat Department cannot buy this wheat themselves. The saving to the Commissariat Department at Fort Stedman has this year been not less than Rs. 30,000 by purchasing direct from the cultivators.

I have not as yet been able to get any statement as to the requirements of the Department for next year so that I am unable to arrange for the necessary seed. Assuming that they will require at least ten lakhs of pounds I shall have to distribute the same quantity of seed as for the past year. The cost of last year's seed is deducted from the Commissariat payments and the balance only given to the cultivators. For next year I propose to buy the lakh and a half pounds required for seed at the rate I am able to realize for the balance of the crop, and then at once issue to the cultivators with instructions how to keep it through the rains, and supply them with bi-sulphide of carbon to protect if from weevils. The way they were treated about their crop in 1894 and 1895 is still so fresh in their memory that unless I supply the seed they will not trust me to take over their crop, and I am in no ways surprised that it is so. The cost of the seed will be less than half what it was for last year, and the security is perfect. There should therefore be no difficulty in making the arrangement and the sooner made the better, as they ought to get the land turned over at once for next year's crop. Until, however, the Commissariat are able to say how much they will require nothing definite can be decided on.

As last year, so this, the wheat is delivered by the cultivators in the local basket which is estimated to weigh 105 lbs., but in fact weighs something over. It is delivered to the Commissariat by weight and payment made per 105 lbs.

The profit accruing to the granary through which the wheat passed has been Rs. 2,535-0-8, including a sum of Rs. 381-3-0 paid into the treasury for the crop of the year before after the annual accounts for 1895-96 were closed. When the balance of the crop has all been collected and sold a further sum of from Rs. 1,000 to Rs. 1,500 should be credited.

A decree in full has been obtained against the defaulting wheat contractor mentioned in the last annual report, but by some oversight it has not as yet been executed. Measures to effect execution have recently been taken.

10. *Potatoes.*—As stated in last year's report 734 viss of kidney potatoes were put in between the 29th April and 13th May. About one half were put in whole and the other moiety in sets.

The seed had not been properly selected by Mr. Colyear, the recent head gardener, who sold what should have been reserved for seed while I was away on tour. The seed was therefore of very indifferent quality. The rains, however, during the months of May, June, and July 1896 were excellent and not too heavy, and the crop thrived in a wonderful way and looked most encouraging.

In August, however, a most persistent, heavy, continuous rain set in and by the middle of the month the whole crop commenced to mildew at the tips of the foliage, most of it being still in flower. By the end of the month not a leaf was left. All growth had suddenly been arrested and disease had apparently set in. The crop was dug in September and October as the weather permitted and the tubers were from only one-half to two-thirds grown. The weight of crop was therefore only 9,886 viss, a great falling off from what I had expected. They were grown between the peas stock in the flat portion of the new extension.

Following the method adopted the last two years, of the above, 911 viss were sown between the fruit trees in about 4 acres of flat land in the old orchard on September 15th to 20th, 1896. In October there was a little rain, but from November to the time they were dug in the following March 1897, there was not a drop. At least two-thirds of them failed to germinate, but remained whole and sound in the ground. In March the few that had germinated, were dug and yielded only 352 viss. The whole plot was thoroughly forked over, however, and all the new potatoes that could be found were collected and all the old seed allowed to remain. The result is that there is now a splendid self-sown crop growing on this 4 acres which I have lately had hoed, and they have come up as regularly in rows and at the intervals in the rows as if sown this year. The greater part of these are no doubt the old seed, though some of the new potatoes which escaped the gardeners have gone to complete the crop. Not only in this plot, but in the whole 7 acres dug last September and October (1896), I have an excellent self-sown crop now standing which I have had weeded and hoed up. Although self-sown from tubers carelessly left in the ground, the plants so far look as well as those planted this year in the regular way.

As the wet-weather crop had died off from disease and the tubers sown from it in September 1896 had almost entirely failed to germinate, I thought it would be safer to import some new seed and grow for this rainy crop and distribute the proceeds when dug among the growers in the Myelat. I accordingly obtained 45 maunds of kidney potato seed from the Director of Land Records. These should have given 1,028 viss of seed, but from shrinkage and wastage on the journey there were only 750 viss when put into the ground in from 19th to 23rd April 1897. These cost over Rs. 400 or nearly eight annas per viss, while my average selling rate for far finer and fresher potatoes is about two annas six pies per viss, so that a change of seed is an expensive matter.

In addition to the self-sown plots (about 11 acres) mentioned above, I have had the following seed sown between 19th April and 3rd May 1897 on about 5 acres of land:—

	Viss.
Imported seed	750
Seed from cold weather crop	155
From Myelat	83
Total ...	988

The Myelat seed was procured from Bawzaing, as the imported seed was so much less than the 45 maunds was estimated to turn out, and I had prepared more land than there was seed for. All has germinated fairly well and is looking well, with the exception of the Bawzaing seed, which was of very inferior quality.

I had the usual difficulty in disposing of the crop in September and October 1896 when dug, and as usual Mr. Browne had to be deputed to Thazi to effect sales. Even then, the bulk of the crop only realized an average of Rs. 16 per 100 viss at the railway, and the cart hire, and wastage and shrinkage cost about Rs. 10 per 100 viss to get them there. The profits are therefore small to the cultivator at this distance from a railway. If the Monè branch line is constructed there is no limit to the extension of the growth of potatoes at a fair profit.

The total receipts for potatoes were Rs. 1,724·12-6 for the 11,563·25 viss sold. The details of cost of growing these will be found in table B annexed and—

	Rs.	A.	P.
Amounted to	228	12	0
Cart-hire and railway fares	888	0	0
For seed potatoes	455	0	0
Total ...	1,571	12	0

It must be remembered that they were grown between the young pear and apple stock and that a great portion of this Rs. 228, for hoeing, weeding, and digging must in any case have been spent in keeping down the jungle, and to have kept the soil loose, as was necessarily done in the interests of the potatoes, was of no less benefit to the fruit trees for the present and for the future.

The money spent and debited to the potatoes was as a fact well spent, even though no crop had been gathered, as the present condition of the young fruit trees will testify. The cost of the imported seed should not in equity be debited against this grant at all as it is grown in the interest of the potato cultivation of the province, as a change of seed in the Myelat is much called for and every tuber garnered will be distributed among the cultivators there for their next year's sowing; but it is not to be expected that they will pay at the rate of eight annas per viss for them—the rate this grant is debited with—when the outturn will not fetch more than Rs. 5 per 100 viss in the market.

This cost of seed therefore is a provincial expenditure and as such should not have been tacked on to my local grant.

For the cart-hire of Rs. 884 no provision was made in the original grant, but Rs. 1,100 more was applied for and sanctioned.

The cultivation of potatoes in the Myelat continues to increase very rapidly annually, and now that the tubers are beginning to find a market in Rangoon a further impetus should be given to the culture.

11. *Orchard.*—In the old orchard all the plantain trees have been grubbed up and apple stock substituted, which have now all been grafted.

The peach trees have fruited well, and a few of the young grafts on the indigenous stock put in in 1894 and 1895 have also fruited. Two nectarine trees have also fruited for the first time and the same two plum trees that fruited last year. There are many stronger and more healthy-looking plum and greengage trees, but they have as yet shown no inclinations to fruit. None of the pears have as yet flowered, but this year there are a large number of young apple trees in fruit that have not been in as long as many of the pears.

The strawberries commenced fruiting in December and have only now (June) just gone out of fruit This year again, in spite of all the instructions given by me and in spite of the failure last year, the watering was neglected while I was away on tour. The main crop was therefore not by any means what it should have been, either in size or flavour, and there were none for sale.

The early berries in December were as fine in size and flavour as one often sees even in England, and the show of fruit when I left for Kēngtūng early in January was enormous and continued so till my return late in March, but there was not sufficient moisture to fill them, and they shrivelled on the stalks. This second failure, though only a partial one on this occasion, is a great disappointment to me. Now that Mr. Colyear has gone, and Maung Se is my head gardener, I am still hopeful of more success in the future.

The grape vines have also been barren. I have now taken them in hand myself and, having improved the drainage as a commencement, hope to be successful, if not this rains the rains after.

The walnuts, filberts, and cobnuts still make *very* slow progress, the walnuts doing the best. Some of the filberts and cobnuts which Mr. Short so kindly sent me, as mentioned last year, have died. The raspberries still resist all endeavours to make them fruit and I am in despair about them. General Cummins kindly sent me a few plants from his garden in Ootacamund, of which all were dead on arrival except three and one of those has since died. The other two are growing well and I am still in hopes of succeeding with them. I have still a large quantity of the English plants alive, and at this moment looking uncommonly healthy, but as they have done the same every year and then fail to flower or fruit in spite of all I have done to assist them, I am in despair of success with them.

I discovered two new kinds of indigenous raspberries during my last year's tour, and have succeeded in getting some very handsome and fine fruit, of a golden colour with a dash of red and as large as filberts, from one of them. The other variety is now in full flower, but does not appear to set any fruit. From one source or another I am still in hopes of having raspberries some day, but I fear never the English variety.

The orange trees look well and flourishing, and some will, I believe, commence to fruit next year. Last year with Mr. Colyear as head gardener the grafting and budding was a good deal in arrears. He left at the end of March and since then this has been done entirely by Maung Se.

The whole of the vacancies in the old orchard which were planted up with stock have now been grafted, and the whole of the apples, pears, and cherry stock in the new extension were completed also early in May. In the new extension there are 16 acres of young grafts and buds growing most luxuriantly and all put in this year, which at 150 trees to the acre (they are planted at intervals of 18 feet) gives 2,400 apple and pear trees. There are also a few hundred plum and cherry grafts, doing most luxuriantly, growing in between or in odd corners. Nothing could look better than these young grafts and there is scarcely a vacancy.

Last year at this season (commencement of June) some 4 acres of apple grafts looked in the same luxuriant condition, but before the end of the month they commenced to die off (as they had the year before) and by the end of the rains not more than 20 per cent. were left alive and many of those have since died.

Some, however, are still alive of last year's grafts, and a few of those of 1895 and of 1894, and those that are alive are growing most luxuriantly. This set me thinking and enquiring, and I wrote to Mr. W. Gollan, the Superintendent of the Government Gardens at Saharunpore, to Mr. F. W. Seers, Superintendent of some Government Gardens at Kumaon, and to some friends at home. I am very much indebted to those gentlemen for the kind way they entered upon the enquiry, and the trouble they took to give me real assistance by their full and detailed surmises as to the cause and suggestions for overcoming the difficulty. All appeared more or less agreed that the cause was the unsuitability of the stock used and all recommended importing stock from home.

In the meantime the whole orchard was planted up with the same indigenous stock, and nurseries were growing of stock for the following year 1897. Independent of that I was loath to give up the attempt to get my European scions established on the wild apple of the country, as the growth of that tree is so quick and luxuriant in exactly the same climate and soil as the orchard, and to give up those advantages and take to English stock could not be thought of without a further struggle.

I accordingly commenced an experiment on some 300 young stock not yet removed from the seed-beds. Usually I plant out the stock and graft *in situ* so as to have less risk of casualties and consequently of gaps from the transplanting.

In early June the apple grafts looked most luxuriant, and by the middle of June had grown from 18 inches to 2 feet high full of leaf and promise. Up to the commencement of June the binding which kept the scion in its place under the wax had not been cut or opened. It was immediately following the cutting of these bindings commencing in June that the trees began to die. By that time the growth was from 18 inches to 2 feet high, and the expansion of both stock and base of scion was of course in comparison.

The tie used for binding was the inner bark of a mulberry tree *sekku shaw*, strong and unyielding. I noticed that it was the stock that died first, and generally from the point of junction towards the roots, though it varied considerably and sometimes commenced half-way down, or at the root itself. Long after the young shoots or the stock had withered and dried the scion was in full life, but it always showed rust, or red drying up of the edges of most of the leaves.

The same red rust appeared in blotches on, or under, the outer bark of the stock and was always when I had become accustomed to observe it the first indication of premature dissolution. With the red blotch on the bark came, the red blotch on the leaf and, though the scion would continue to live, and even to grow for a month or more after that, it was as doomed as one with the plague spot.

From the above I formed a theory that stranguiation by the wrapping was the cause of death, and at the end of June (much too late for grafting successfully) I had some 300 grafts put in on the brother stocks still remaining in the seed-beds. Many of these did not take (being out of season), but some 200 did, and as soon as the first leaves unrolled on the scion, showing an undoubted junction, I had the wax opened and the wrapping severed completely, and the wax then pressed back to keep the rain and air out. I was pleased to see that when I left for Kēngtūng the following January some 90 per cent. were alive and well instead of only about 10 per cent. of those that had been grafted *in situ*.

It was thus clear to me that the failure in the grafts was due either (*a*) to strangulation, or (*b*) to the season of grafting.

None of my correspondents will admit the validity of the former theory, and so it must be the latter Nevertheless I have this year, by the advice of Mr. Gollan, grafted rather earlier instead of later, commencing with these apples in February, and I have been careful to see that the bindings have been cut as soon as the junctions became apparent.

I found also that from the action of the sun and rain the compound I used for wax becomes almost as hard as cement in some cases, so I have had all this taken off and clay substituted.

Out of some 1,500 apple grafts put in some 20 plants have up to the present gone off under the former symptoms, but I am still in hopes that I may succeed, and at any rate shall not yet give in. I have now at least 50 apple trees growing must luxuriantly on this stock, the few survivors of my grafts for 1894-95 and 1986 and from them I shall get hundreds of scions next year. By grafting with them, even if my present experiment fails, as they will be half bred indigenous stock, I feel sanguine of success.

On the other hand they do not represent quite all the varieties of apples I should like to get on to these stock, so that I must still persevere on the old lines. Supposing a failure this year, I shall then try the other experiment of not grafting until the sap is in full flow—end of June.

To complete the record I must now add that, as the verdict of the experts was in favour of the unsuitability of the stock, I sent the fruit, flowers, and leaves of the present

trees used as stock to Dr. King, giving him a rough sketch of the situation. I was, however, so confident that the stock used was the true apple, as I have often eaten tarts made of the fruit and have seen it in flower and in fruit, that I placed but little importance on this verdict. I have lately received it, and it has been a shock to me to learn that my stock is not the true wild apple which is *Pyrus malus*, while my stock is *Docynia Indica* closely allied, but yet distinct. Dr. King writes: "and it is this fact no doubt which explains the "imperfect success of your attempts at grafting the cultivated apple. I am surprised that "you had any success at all."

Dr. King then recommends me to try *Pyrus pashia* as stock.

This is rather a shock, but I am still inclined to persevere in my experiment if, as I hope, the grafts of this year will most of them stand. *Pyrus pashia* or *pathia* only grows here where there is more or less water near the surface, when in its natural state, and it never grows in the magnificent trees that the *Docynia Indica* does, so that if I can avoid it I shall not use it. I am already using it as stock for the pears which I am planting in the lowlands of the orchard, where there is water near the surface, and where therefore I fancy it will grow well. The grafts put in this year certainly could not well look, or have done, better, but I yet hope to succeed with the *Docynia Indica*, for the apples on the slopes, their natural habitat and soil. That the two Genesa of "Pyrus" and "Docynia" are not far apart is clear, as the fruit of the latter makes most excellent apple tart, and I see that Dr. Hurz, in his "Forest Flora of British Burma" calls it "*Pyrus Indica*."

It is at any rate worth while to carry the experiment through, having got so far, as, if I can succeed, the enormous advantage of getting the English apple on to the indigenous stock, when that stock is such a quick and strong grower, cannot well be over-estimated in the interests of future growers.

The garden has from its inception been an "experimental" once (and the only one in Burma) so that the present experiment only adds one more to the number, but as it is of such importance, and may be of interest to my kind correspondents who have assisted me with it, I have been thus detailed and prolix.

12. *Rhubarb.*—Although this succeeds well for the year in which imported and planted, I have never as yet succeeded in getting my instructions fully carried out for the preservation of the plants through the four or five months I am away in the dry season on tour, so that there has always been a great loss of life instead of an increase in the stock. This year I again imported plants, about half of which only are growing. In time, and under Maung Se's care, I hope to succeed better in improving the stock of this most desirable plant. These prolonged annual tours at the critical period of the year ere a great drawback.

13. *Jerusalem Artichokes.*—For the year under report these tubers were allowed to remain in the ground, as former experience showed that when dug and stored they shrivelled and when planted failed to germinate. I regret to say that the experiment of keeping them in the ground throughout the dry season has not been as successful as I had hoped. They are eaten by grubs almost entirely, but such tubers as have escaped their ravages look healthy and have been planted out. There are no signs of growth at present. Some imported tubers which arrived during my absence and were buried in what was called *dry* sand, have also either rotted or dried up. I fancy the sand must have been *damp*. The experiment has at any rate failed, and further effort will be made this year with *well dried* sand and, if I can succeed in getting a stock from the seed now put in and in getting the newly grown tubers buried in really dry sand, I am in hopes of succeeding.

14. *Flowering Plants.*—Besides Jerusalem artichokes and rhubarb I imported some flowering bulbs and plants of the following species :—

Dahlias, iris, narcissus, begonias, violets, daffodils, hyacinths.

The begonias have succeeded well, and are now in full flower and most luxriant. The violets are also doing well. The others are doubtfull, the iris looking the most likely to succeed.

Of flowers imported in former years, the roses and chrysanthemums continue to thrive as well as the geraniums.

I have no establishment to keep up reliable registers of the plants that have been distributed gratis, though I have made more than one attempt. My prolonged absences on tour and the want of a competent clerk have always rendered my registers too inaccurate to be of any practical use.

The following, however, have been distributed :—

Large quantities, many hundreds in fact, of roses of all sorts, both cutting and plants.
Geraniums of all sorts, both cuttings and plants.
Chrysanthemums, over 100 plants.
Dahlias, a small quantity of some 10 very fine varieties.
Potatoes, one maund of kidney potatoes to the Chin Hills.
Pears, over 100 trees to the Chiefs in the Myelat.

Cherries, over 100 trees to the Chiefs in the Myelat.
Strawberries, ten thousand plants and upwards to several places.

As far as I can learn they all rotted on the way as they were sent in the rains, though they were sent by parcel post. For the future they shall be sent in the cold seasons.

No charge has been made for the above, but as the spare stock increases and the demand rises so as to make it worth while to entertain a clerk for the purpose, who can pack as well as register, a small sum may be collected under this head, and in course of time it should become a considerable source of profit.

Financial.—From Statement A it will be seen that Rs. 4,893-0-5 was spent on the orchard during the year of report. From the details of expenditure given in Statement B it will be seen that Rs. 2,859-1-8 was spent on the establishment of gardeners. Now that I have dispensed with the services of Mr. Colyear, Rs. 150 per mensem, and have arranged to carry on the work under my direct supervision, with an addition to the existing native establishment of Rs. 20 only, there will be a saving for the future under this head of Rs. 130 per mensem or Rs. 1,560 per annum.

Other heavy items of expenditure during the year which come under the head of capital and are not recurring, are—

To replace the temporary bridges, both cart and foot, over the many drainage channels, which had fallen in or become unsafe from the weather and white ants, a sum of Rs. 408-4-3 has been expended. The bridges now put in are all of sound teak, painted with two coatings of "carbolineum" as a further preservative.

The quick-set fence having now reached sufficient maturity to hold its own without the aid of the bamboo fence originally put up to protect but now fallen into decay, this bamboo fence has been cleared away and at the gateways instead of the bamboo bars are now strong substantial teak-wood gates, painted green on a basis of red lead. The cost of these has been Rs. 486.

The following smaller items are also not recurring:—

	Rs.	A.	P.
Digging out plantain trees	94	5	9
Temporary gabions for trees planted on road sides in station	86	0	0
Earthen pipes for drains	84	0	0
	264	5	9
Add for gates	486	0	0
Add for bridges	408	4	3
Total ...	1,158	10	0

Thus of the total expenditure Rs. 1,158-10-0 may be regarded as from capital, and there are other items as follows which can only recur every second or third year or so:—

	Rs.	A.	P.
Cost of flower pots	49	1	2
Cost of zinc labels	50	11	3
Cost of powder and shot to shoot stray dogs and little birds	36	14	0
Cost of repairs to godowns	41	12	0
Cost of re-building gardeners' houses	208	4	5
Total ...	386	10	10

With the saving in establishment and these charges which will not appear again, the upkeep of the orchard should be amply covered next year by the receipts.

This year, as already stated, when all the earnings are credited, the cost of the whole experiment will not exceed Rs. 1,000 more or less.

16. *Concluding remarks.*—The experiment in fruit culture may, I think, be considered encouraging and the small excess of expenditure over receipts even now, before any of the trees have really commenced to bear fruit in any quantities, is a matter for congratulation.

If the culture of apples and pears is successful it must prove to be very lucrative for many years to come, the competition being *nil.*

The softer fruits can only pay when grown near a railway. There is no community within range to create a demand for such. That they will grow, and that in time the Shan Chiefs and people will take to the culture, there is now not much room for scepticism. Next year there should be a good stock of apple, pear, and cherry trees for distribution, as also of flowering plants.

This year the peaches were ripe a full month earlier than last year owing to the mild winter; a severe hail storm which covered the whole place as though under heavy snow, and the stones being unusually large and formidable, occurring on 26th March, and every

peach was so advanced as to be ruined. Full half of the fruit and foliage was ruthlessly stripped from the trees, and those that remained were pitted as though with small-pox. Ripening as early as they did, before rainfall, they were small in size for want of moisture to fill the fruit, but of more than usually good flavour and these pits only spoilt their appearance; but as soon as the rain came and the consequent insect life commenced to abound, they offered too tempting a prey, and what with the water standing in them and rotting them, and the depredations of the insects, fully half of the remaining crop was destroyed.

Everything, both flowers and fruits, is a month in advance of any previous year that I have been here.

Thieves have also taken to nightly depredations, and one splendid tree of fine large plums was stripped in a night before a sigle fruit was ripe. There are many enemies to contend with besides the elements.

Beyond the limits of the Taunggyi civil police station I can hear of no roadside planting being done by Government agency, which is a pity. The Forest or Public Works Officers are the only ones in a position to do this, and my hopes in them are once more at a low ebb.

Some 500 of the trees planted by Mr. Giles at Thamakan are said to be doing fairly well and a great boon they will be in that wind-swept place. Mr. Browne has also added a few to those.

A list of stock of fruit trees in the orchard in November 1896 is appended. From it it will be seen that there is a large variety to experiment upon.

A. H. HILDEBRAND,
Superintendent and Political Officer,
Southern Shan States.

TAUNGGYI:
The 6th June 1897.

STATEMENT I.—*Actual total receipts and disbursements from 1st June 1896 to 31st May 1897 (year under report).*

Receipts.	Amount.	Disbursements.	Amount.
	Rs. A. P.		Rs. A. P.
(a) By budget allotment ...	6,500 0 0	(a) On orchard ...	4,893 0 5
(b) By sale of vegetables ...	292 2 9	(b) On garden ...	211 7 9
(c) By sale of fruits and others ...	6 15 0	(c) On potatoes ...	1,571 12 0
(d) By sale of potatoes ...	1,724 12 6	(d) On wheat ...	0 4 0
(e) By sale of wheat ...	2,535 0 8		
Total ...	11,058 14 11	Total ...	6,676 8 2

STATEMENT II.—*Details of disbursements from the 1st June 1896 to 31st May 1897.*

Details.	Amount,
	Rs. A. P.
(1) *Orchard.*	
(a) Establishment	2,859 1 8
(b) Coolie hire for conveying trees	25 8 0
(c) Coolie hire for digging out plantain trees and planting apple trees in their places ...	94 5 9
(d) Cost of fruit trees	56 3 3
(e) Coolie hire for making gabions	86 0 0
(f) Cost of garden tools	72 6 0
(g) Making gates with hinges, lock, and painting	486 0 11
(h) Cost of making baskets	12 4 0
(i) Coolie hire for conveyance of earthen pipes for drains	84 0 0
(j) Cost of flower pots	49 1 2
(k) Cart hire for conveyance of empty bags	13 8 0
(l) Cost of zinc labels	50 11 3
(m) Coolie hire for conveying soil to strawberry beds	5 8 0
(n) Cost of grease, &c., for Government carts	5 12 0
(o) Cost of powder, shot, and caps	36 14 0
(p) Mending weeding fence	21 5 9
(q) Coolie hire for planting creeping grass and digging and levelling ground ...	28 5 0
(r) Cost of semi-circular iron hoops	9 6 0
(s) Advertising strawberry plants	11 4 0
(t) Cost of thatching shed and repriring godowns	41 12 0
(u) Cost of wax and *sitse*	76 1 0
(v) Cost of nets	71 12 0
(w) Herding Government bullocks	65 0 0
(x) Building gardeners' houses	208 4 5
(y) Making bridges	408 4 3
(z) Miscellaneous	14 6 0
Total ...	4,893 0 5
(2) *Garden.*	
(a) Establishment	175 0 0
(b) Cost of vegetable seeds	36 7 9
Total ...	211 7 9
(3) *Potatoes.*	
(a) Conveyance (cart hire)	884 0 0
(b) Preparing ground and sowing (coolie hire)	112 7 0
(c) Hoeing (coolie hire)	53 10 0
(d) Weeding (coolie hire)	62 11 0
(e) Railway fares	4 0 0
(f) Cost of potatoes (Bawzaing)	55 0 0
(g) Cost of potato seed (Director of Land Records)	400 0 0
Total ...	1,571 12 0
(4) *Wheat.*	
(a) Conveyance (coolie hire)	0 4 0
Total ...	0 4 0

STATEMENT II.—*Details of disbursements from the 1st June 1896 to the 31st May 1897.*

Details.	Amount.
Total expenditure up to 31st March 1897 from 1st June 1896.	Rs. A. P.
(a) Orchard	3,695 12 8
(b) Garden	183 7 9
(c) Potatoes	1,519 4 0
(d) Wheat	0 4 0
Total ...	5,398 12 5
Total expenditure from 1st April 1897 to 31st May 1897.	
(a) Orchard	1,197 3 9
(b) Garden	28 0 0
(c) Potatoes	52 8 0
Total ...	1,277 11 9
Grand total from 1st June 1896 to 31st May 1897.	
(a) Orchard	4,893 0 5
(b) Garden	211 7 9
(c) Potatoes	1,571 12 0
(d) Wheat	0 4 0
Total ...	6,676 8 2

List of Fruit Trees in Orchard, 1896.

APPLES.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From grafts, 1895.	Buds and Grafts. Alive.	Buds and Grafts. Failed.	Plants not labelled.	Total of each.	Total 1895.	Increase.	Decrease.
1	Worcester pearmain ...	14	...	...	...	...	...	...	14	4	10	...
2	Cashmere	...	1	...	...	...	...	...	1	2	...	1
3	Rymer	...	...	2	...	2	...	...	4	2	2	...
4	Cornish gilly flower	...	...	3	...	1	...	...	4	3	1	...
5	Sturmer pippin	1	...	...	...	2	...	...	3	1	2	...
6	Duke of Devonshire ...	...	2	...	...	1	...	...	3	2	1	...
7	Bramley's seeding	16	...	...	...	12	...	...	28	7	21	...
8	Hawthornden	...	1	1	...	1	...	...	3	5	...	2
9	Cox's orange pippin	5	...	...	...	20	...	...	25	6	19	...
10	Stirling Castle	17	...	...	...	1	...	...	18	7	11	...
11	Blenheim orange	16	...	...	3	27	...	...	46	12	34	...
	Carried over ...	69	4	6	3	67	...	...	149	51	98	1

List of Fruit Trees in Orchard, 1896—continued.

APPLES—concluded.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From grafts, 1895.	Buds and Grafts. Alive.	Buds and Grafts. Failed.	Plants not labelled.	Total of each.	Total 1895.	Increase.	Decrease.
	Brought forward ...	69	4	6	3	67	...	...	149	51	98	...
12	Dutch Mignonne	...	1	...	...	...	...	...	1	1	...	...
13	Mannington's pearmain ...	2	...	...	...	1	...	...	3	2	1	...
14	New Northern greening ...	3	...	..	...	...	...	...	3	3	...	...
15	Devonshire quarrenden ...	4	...	...	...	2	...	...	6	4	2	...
16	Ecklinville seedling	14	...	...	1	9	...	...	24	5	19	...
17	Sykehouse Russet	...	...	1	...	...	...	...	1	1	...	...
18	Ribston pippin	9	1	2	...	1	...	...	13	10	3	...
19	King of pippins	6	2	1	...	1	...	...	10	9	1	...
20	Lane's Prince Albert ...	12	...	...	...	...	...	...	12	4	8	...
21	Dumclow's seedling	10	...	...	...	2	...	...	12	5	7	...
22	The Queen	13	...	...	1	10	...	...	24	4	20	...
23	Warner's King	13	...	...	1	7	...	...	21	6	15	...
24	Annie Elizabeth	8	...	...	...	...	...	...	8	3	5	...
25	Bess Pool	3	...	...	...	...	...	...	3	4	...	1
26	Golden white pearmain ...	3	...	...	1	8	...	...	12	5	7	...
27	Lord Grosvenor	11	...	...	...	...	...	...	11	3	8	...
28	Cox's Pomona	6	...	...	...	7	...	...	13	2	11	...
29	Cockle pippin	...	...	2	...	...	...	...	2	2	...	...
30	Northern greening	7	...	...	...	8	...	...	15	2	13	...
31	Celine pippin	7	...	...	...	1	...	...	8	2	6	...
32	Woodhurst pippin	...	3	...	...	...	...	...	3	3	...	...
33	Early harvest	...	2	...	...	...	...	...	2	3	...	1
34	Newton pippin	...	2	...	...	...	...	...	2	3	...	1
35	Good seedfield	2	...	...	...	...	...	...	2	2	...	...
36	Fairy	...	3	...	...	...	...	...	3	3	...	...
37	Nonpariel	...	2	...	...	2	...	...	4	2	2	...
38	New Hawthornden	12	...	...	...	...	...	...	12	2	10	...
39	Golden Reineth	...	2	...	...	...	...	...	2	2	...	...
40	Golden Harvi	...	...	...	...	...	...	...	...	2	...	2
41	Kentish pippin	...	3	...	...	...	...	...	3	3	...	...
42	Melon pippin	...	...	...	...	...	...	...	...	1	...	1
43	Oslin pippin	...	3	..	...	...	...	...	3	4	...	1
44	Francis pippin	...	2	...	...	...	...	...	2	2	...	...
45	Almora, No. 1	...	...	1	...	...	...	...	1	1	...	...
46	Almora, No. 3	...	...	1	...	...	...	...	1	1	...	...
47	Peasgood Nonsuch	13	...	...	...	4	...	...	17	2	15	...
48	Yellow Fugestin	5	...	...	...	...	...	...	5	...	5	...
49	Tyler's kernel	10	...	...	...	...	...	...	10	...	10	...
50	Lord Suffield	10	...	...	...	...	...	...	10	...	10	...
51	Gascoigne's seedling... ...	4	...	...	...	...	...	...	4	...	4	...
52	Grenadin	5	...	...	...	...	...	...	5	...	5	...
53	Gold medal	9	...	...	...	...	...	...	9	...	9	...
54	Duchess of Oldenburg ...	10	...	...	...	...	...	...	10	...	10	...
55	Chelmsford wonder	5	...	...	...	...	...	...	5	...	5	...
56	Lady Sudely	4	...	...	...	...	...	...	4	...	4	...
57	Frogmore prolific	5	...	...	...	...	...	...	5	...	5	...
58	Pott's seedling	5	...	...	...	...	...	...	5	...	5	...
59	Golden spire	5	...	...	...	...	...	...	5	...	5	...
60	Beauty of Bath	5	...	...	...	...	...	...	5	...	5	...
61	Tower of Glaims	4	...	...	...	...	...	...	4	...	4	...
62	Bismark	3	...	...	...	...	...	...	3	...	3	...
63	Irsh peach	9	...	...	...	...	...	...	9	...	9	...
64	Mr. Gladstone	5	...	...	...	...	...	...	5	...	5	...
65	Sandringham	4	...	...	...	...	...	...	4	...	4	...
66	Without label	...	...	...	...	...	...	16	16	...	16	...
67	Apple stocks	...	...	...	...	...	...	...	...	...	...	...
	Total ...	334	30	14	7	130	726	16	531	164	374	...

List of Fruit Trees in Orchard, 1896—continued.

PEARS.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From grafts, 1895.	Buds and Grafts. Alive	Buds and Grafts. Failed.	Plants not labeled.	Stocks.	Total of each.	Total 1895.	Increase.	Decrease.
1	Marie Louise	7	2	...	12	8	...	...	...	29	18	11	...
2	Victoria	...	2	...	9	2	...	...	...	13	12	1	...
3	Louise Bonne de Jersey ...	15	2	...	6	4	...	...	...	27	13	14	...
4	Doyennedu Comice ...	13	...	...	...	1	...	...	...	14	3	11	...
5	Glout Morceau	10	...	...	1	...	...	...	...	11	6	5	...
6	Jargonelle	15	2	...	18	8	...	...	...	43	27	16	...
7	Thomsons	...	...	1	...	...	...	...	...	1	1	...	...
8	Beune superfine ...	5	...	...	2	...	...	...	...	7	3	4	...
9	Flemish Beauty	...	2	1	14	2	...	...	...	19	19		...
10	Pitmaston Duchess ...	15	...	...	2	...	...	...	...	17	7	10	...
11	Easter Beune	14	...	...	10	1	...	...	...	25	15	10	...
12	Huyshes' Bergamotte ...	...	2	...	9	9	...	...	...	20	12	8	...
13	Bergamotte D'Esperen ...	7	...	...	2	1	...	...	...	10	4	6	...
14	Williams' Bon Chretien ...	12	...	...	...	...	...	...	...	12	3	9	...
15	Winter Nelis	9	...	...	3	7	...	...	...	19	7	12	...
16	Catillae	7	...	...	1	2	...	...	...	10	4	6	...
17	China	...	1	...	...	...	...	...	...	1	1	...	...
18	La Counte	...	30	...	...	15	...	...	...	45	30	15	...
19	Kriffer	...	30	...	...	...	...	...	...	30	31	...	1
20	Conseiller de la Cour ...	7	...	...	...	...	...	...	...	7	2	5	...
21	General Todleben ...	7	...	...	...	3	...	...	...	10	2	8	...
22	Beune Diel	7	...	...	...	3	...	...	...	10	2	8	...
23	Rivers Fertility	7	...	...	...	...	...	...	...	7	2	5	...
24	Beune Hardy	12	...	...	...	...	...	...	...	12	2	10	...
25	Beune D'Amanlis ...	12	...	...	...	3	...	...	...	15	2	13	...
26	Doyenne du Boussoch ...	6	...	...	...	...	...	...	...	6	...	6	...
27	Uvedale St. Germain ...	5	...	...	...	...	...	...	...	5	...	5	...
28	Fondante D'Autumn ...	5	...	...	...	...	...	...	...	5	...	5	...
29	Beune Ravee	11	...	...	...	...	...	...	...	11	...	11	...
30	Duchesse D'Angouleme ...	5	...	...	...	...	...	...	...	5	...	5	...
31	Beune D'Aremburg ...	5	...	...	...	...	...	...	...	5	...	5	...
32	Hassell	5	...	...	...	...	...	...	...	5	...	5	...
33	Brockworth Park ...	5	...	...	...	...	...	...	...	5	...	5	...
34	Doyenne D'Ete ...	5	...	...	...	...	...	...	...	5	...	5	...
35	Magnate	5	...	...	...	...	...	...	...	5	...	5	...
36	Clapp's favourite ...	11	...	...	...	...	...	...	...	11	...	11	...
37	Souverine de Congress ...	5	...	...	...	...	...	...	...	5	...	5	...
38	Gratioli of Jersey ...	5	...	...	...	1	...	...	...	6	...	6	...
39	Treyve	4	...	...	...	...	...	...	...	4	...	4	...
40	Beune D'Assumption ...	10	...	...	...	...	...	...	...	10	...	10	...
41	Comte D'Lamy	5	...	...	...	3	...	...	...	8	...	8	...
42	Beune Bachelier ...	5	...	...	...	...	...	...	...	5	...	5	...
43	Beune de Clairgeau ...	5	...	...	...	...	...	...	...	5	...	5	...
44	Baronne de Mello ...	5	...	...	...	...	...	...	...	5	...	5	...
45	Passe Colmar ...	4	...	...	...	...	...	...	...	4	...	4	...
46	Beune Capiamont ...	4	...	...	...	...	...	...	...	4	...	4	...
47	Durandean	5	...	...	...	...	...	...	...	5	...	5	...
48	Josephine de Malines ...	4	...	...	...	...	...	...	4	4	...	4	...
	.....	...	...	...	...	...	...	10	...	10	...	10	...
	.....	...	...	...	...	...	8	...	610	...	...	...	...
	Total ...	310	73	2	89	73	8	10	614	557	228	329	...

List of Fruit Trees in Orchard, 1896—continued.

PLUMS.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From grafts, 1895.	Buds and Grafts. Alive.	Buds and Grafts. Failed.	Plants not labelled.	Total of each.	Stocks.	Total 1895.	Increase.	Decrease.
1	Kabul greengage ...	...	1	...	...	...	...	...	1	...	1	...	...
2	Guthrie's late greengage ...	...	2	...	3	13	...	...	18	...	6	12	...
3	Prince Englebert ...	7	...	...	...	5	...	...	12	...	7	5	...
4	Rune Claude de Violette ...	...	2	...	...	...	...	...	2	...	2	...	...
5	Jefferson	7	2	..	...	3	...	...	12	...	9	3	...
6	Washington	...	1	...	...	...	...	...	1	...	1	...	...
7	Victoria	5	...	...	2	6	...	...	13	...	8	5	...
8	Early prolific	6	3	...	13	7	...	...	29	...	26	3	...
9	Alucha, black	...	1	...	...	...	...	...	1	...	1	...	...
10	Chettenden damson ...	1	...	...	...	...	...	...	1	...	1	...	...
11	Black diamond	6	...	...	2	4	...	...	12	...	8	4	...
12	Cox's golden drop ...	6	3	...	1	6	...	...	16	...	10	6	...
13	Early dwarf, yellow ...	...	1	...	...	...	...	...	1	...	1	...	...
14	Greengage	6	...	...	1	5	...	...	12	...	7	5	...
15	Bruhy's greengage ...	...	...	2	2	...	...	...	4	...	5	...	1
16	Smith's purple prolific ...	3	...	...	...	...	...	...	3	...	3	...	...
17	Alucha, red	...	1	...	...	...	...	...	1	...	1	...	...
18	Denniston's superb ...	6	...	...	...	6	...	...	12	...	6	6	...
19	Goldengage	...	2	...	3	6	...	...	11	...	7	4	...
20	Alubukhara, large ...	...	2	...	...	...	...	...	2	...	1	1	...
21	Asparic	...	1	...	...	...	...	...	1	...	1	...	...
22	Prune	...	1	...	2	5	...	...	8	...	3	5	...
23	Alubukhara, small ...	...	1	...	...	...	...	...	1	...	...	1	...
24	From tree No. 2, row No. 1...	...	...	...	...	6	...	...	6	...	...	6	...
		...	...	...	...	...	37	9	9	86	...	9	...
	Total ...	53	24	2	29	72	37	9	189	86	115	74	...

PEACHES.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From grafts, 1895.	Buds and Grafts. Alive.	Buds and Grafts. Failed.	Plants not labelled.	Total of each.	Stocks.	Total 1895.	Increase.	Decrease.
1	Early Rivero	...	...	8	2	17	...	...	27	...	15	12	...
2	Large Agra	...	2	...	...	5	...	...	7	...	2	5	...
3	Hardoi	...	1	...	...	...	...	...	1	...	1	...	...
4	Violette Hative	3	...	...	...	...	...	...	3	...	4	...	1
5	Country No. 2	...	2	...	...	2	...	...	4	...	3	1	...
6	Rhenny Shipstone ...	...	...	1	1	3	...	...	5	...	2	3	...
7	Dr. Hogg	...	...	2	...	3	...	...	5	...	2	3	...
8	Honey	...	...	2	...	4	...	...	6	...	2	4	...
9	Chura, flat	...	1	...	...	...	...	...	1	...	1	...	...
10	Grosse Mignonne ...	3	...	...	1	...	...	...	4	...	6	...	2
11	Stirling Castle	...	...	2	1	...	...	...	3	...	3	...	...
12	Anderson's spring hill ...	...	...	1	...	1	...	...	2	...	1	1	...
13	Early York	...	...	1	...	...	...	...	1	...	1	...	...
14	Prince of Wales ...	2	...	...	...	2	...	...	4	...	2	2	...
15	Belle Garde	2	...	...	...	...	...	...	2	...	2	...	...
16	Alexander Noblesse ...	3	...	...	1	...	...	...	4	...	4	..	...
17	Royal George	3	...	...	2	3	...	...	8	...	5	3	...
18	Peach, Madras	...	2	...	7	10	...	...	19	...	9	10	...
19	Crimson Galaude ...	2	...	...	3	5	...	...	10	...	10	...	...
20	Country No. 1	...	3	...	...	...	...	...	3	...	3	...	...
21	Hakim	...	2	...	...	4	...	...	6	...	2	4	...
22	Country No. 3	...	1	...	...	2	...	...	3	...	1	2	...
23	Country No. 4	...	3	...	...	9	...	...	12	...	1	11	...
		...	...	...	...	...	29	3	3	46	...	3	...
	Total ...	18	17	17	18	70	29	3	143	46	82	61	...

List of Fruit Trees in Orchard, 1896—continued.

APRICOTS.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From grafts, 1895.	Buds and Grafts. Alive.	Buds and Grafts. Failed.	Plants not labelled.	Total of each.	Stocks.	Total 1895.	Increase.	Decrease.
1	Hemskirke	4	2	...	...	...	...	...	6	...	6	...	...
2	Moor Park	5	3	4	1	3	...	...	16	...	13	3	...
3	Large, early	3	...	...	...	...	...	...	3	...	4	...	1
4	Cashmere	...	3	...	...	2	...	...	5	...	3	2	...
5	New large, early ...	1	...	2	...	...	...	...	3	...	2	1	...
6	Royal	...	...	3	1	2	...	...	6	...	5	1	...
7	Brussels	...	...	2	2	...	...	...	4	...	4	...	...
8	Early orange	...	...	2	1	4	...	...	7	...	3	4	...
9	Frogmore, early	...	...	2	...	...	...	...	2	...	2	...	...
10	Golden drop	...	2	...	...	...	...	...	2	...	2	...	...
11	Mexican	...	2	...	...	...	...	...	2	...	2	...	...
	....	...	...	...	...	...	...	11	11	...	...	11	...
	Total ...	13	12	15	5	11	...	11	67	...	46	21	...
	NECTARINES.												
1	Claremont	...	2	...	...	31	...	...	33	...	2	31	...
2	Kabul	...	2	...	...	10	...	...	12	...	2	10	...
3	Murray	...	2	...	2	3	...	...	7	...	6	1	...
4	Peach	...	...	1	...	5	...	...	6	...	1	5	...
5	Elruge	3	...	...	...	...	...	...	3	...	3	...	...
9	Lord Napier	2	...	...	...	...	...	...	2	...	2	...	...
7	Pitmaston orange ...	3	...	...	5	1	...	...	9	...	11	...	2
8	New, white	...	3	...	...	40	...	...	43	...	2	41	...
9	Hardwick's, early ...	5	...	...	3	...	...	...	8	...	8	...	...
	....	...	...	...	...	...	...	2	2	...	...	2	...
	Total ...	13	9	1	10	90	...	2	125	...	37	88	...

CHERRIES.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	Buds and Grafts. Alive.	Buds and Grafts. Failed.	Plants not labelled.	Total of each.	Stocks.	Total 1895.	Increase.	Decrease.
1	May Duke	6	...	...	1	...	...	7	...	6	1	...
2	Biganeau Napoleon	6	...	...	1	...	...	7	...	6	1	...
3	Warder's early black ...	8	...	...	2	...	...	10	...	8	2	...
4	Biganeau	5	...	...	...	...	...	5	...	5	...	...
5	Kentish	6	...	...	4	...	...	10	...	6	4	...
6	Knight's early black ...	6	...	...	...	...	...	6	...	6	...	...
7	Florence	5	...	...	...	...	...	5	...	5	...	...
8	Morello	3	...	...	...	...	...	3	...	3	...	...
9	Elton	3	...	...	...	...	...	3	...	3	...	...
10	Almora, No. 207	...	...	2	...	...	...	2	...	2	...	...
	....	...	...	...	...	33	1	1	89	...	1	...
	Total ...	48	...	2	8	33	1	59	89	50	9	...
	Quince	...	...	...	...	...	...	5	...	...	5	...
	Mulberry	...	...	...	...	...	...	1	...	...	1	...
	Vacancies	...	...	...	...	...	...	177	...	...	177	...

List of Fruit Trees in Orchard, 1896—concluded.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From cuttings.	Total of each.	Total 1895.	Increase.	Decrease.
	Vines.								
1	Black Hamburg	6	...	...	...	6	6	...	...
2	Miss Pearson	...	...	1	...	1	1	...	...
3	Gross Colmar	..	...	2	...	2	2	...	...
4	Muscat Alexendri	1	...	...	...	1	1	...	...
5	Trentham black	...	...	2	...	2	2	...	...
6	West St. Peter	...	...	2	...	2	2	...	...
	Total ...	7	...	7	...	14	14	...	...
	Figs.								
1	Brown Turkey	6	...	...	16	22	6	16	...
2	Large Negro	2	...	...	1	3	2	1	...
	Total ...	8	...	...	17	25	8	17	...
	Currants.								
1	Red Dutch	6	...	...	15	21	16	5	...
2	Raby Castle	1	...	...	...	1	2	...	1
3	Black Naples	...	...	...	3	3	5	...	2
	Total ...	7	...	...	18	25	23	2	...
	Gooseberries.								
1	White Smith	1	...	...	...	1	4	...	3
2	Crown Bob	1	...	...	...	1	3	...	2
	Total ...	2	...	...	...	2	7	...	5
	Nuts.								
1	Walnuts	...	...	...	...	23	32	...	9
2	Hazelnuts	...	...	...	...	7	9	...	2
3	Cobnuts	...	...	...	...	5	10	...	5
4	Filberts	...	...	...	...	6	6	...	...
	Total ...	...	...	...	...	41	57	...	16

APPENDIX B.

STATEMENT No. III.—*Distribution list of seed obtained for experimental cultivation during 1896-97.*

No.	How distributed.		Maize (a).		Tobacco (b).		English vegetable seeds (c).		Wheat (d).		Gram (e).		Potato (f).		Oats (g).	
	District.	Designation or name of officer receiving seed.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Lower Burma.		Cobs.		lbs.		lbs.		Mds.		Mds.		Ms.		Mds.	
1	Hanthawaddy ...	Deputy Commissioner	50	21st April 1896	2	3rd July 1896	...	.....	...	.....	...	.....	...	.....	...	...
2	Tharrawaddy ...	ditto ...	20	ditto ...	1	ditto ...	...	.....	...	.....	...	.....	...	.....	...	...
3	Pegu ...	Manager, Kyaukt a g a Grant.	10	15th May 1896	...	.....	...	.....	...	.....	...	.....	...	.....	...	...
4	Bassein ...	Deputy Commissioner	15	21st April 1896	½	3rd July 1896	...	.....	...	.....	...	.....	...	.....	...	...
5	Myaungmya ...	ditto ...	15	ditto ...	1	ditto ...	...	.....	...	.....	...	.....	...	.....	...	...
6	Amherst ...	ditto ...	30	ditto ...	½	ditto ...	...	.....	...	.....	...	.....	...	.....	...	...
7	Moulmein ...	Secretary, Agri-Horticultural Society.	20	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	...
8	Toungoo ...	Deputy Commissioner	20	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	...
9	Toungoo ...	J. Peltey, Esq. ...	20	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	...
10	Thatôn ...	*Deputy Commissioner*	60	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	...
11	Tavoy ...	ditto ..	20	ditto ...	1	3rd July 1896	...	.....	...	.....	...	.....	...	.....	...	...
12	Mergui ...	ditto ...	30	ditto ...	1	ditto ...	...	.....	...	.....	...	.....	...	.....	...	...
13	Salween ...	ditto ...	60	ditto ...	1½	ditto ...	...	.....	...	.....	...	.....	...	.....	...	...
	Upper Burma.															
14	Minbu ...	Deputy Commissioner	100	21st April 1896	1	3rd July 1896	...	.....	...	.....	...	.....	...	.....	...	...
15	Magwe ...	ditto ...	50	ditto ...	2	ditto ...	...	.....	...	.....	...	.....	...	.....	...	...
16	Thayetmyo ...	ditto ...	20	ditto ...	1	ditto ...	...	.....	...	.....	...	.....	...	.....	...	...
17	Mandalay ...	dtito ...	80	ditto ...	4	ditto ...	3	1st October 1896 ...	...	.....	...	.....	...	.....	...	...
18	Katha ...	ditto ...	50	ditto ...	...	.....	3	ditto ...	...	.....	...	.....	...	.....	...	...
19	Ruby Mines ...	ditto ...	50	ditto ...	...	.....	3	ditto ...	...	.....	2	16th July 1896	...	.....	...	...
20	Myitkyina ...	ditto ...	20	ditto ...	1	3rd July 1896	3	ditto ...	2	10th December 1896.	...	.....	...	.....	...	...
21	Bhamo ...	ditto ...	...	.....	...	.....	3	ditto ...	...	.....	...	.....	...	.....	...	...
22	Sagaing ...	ditto ...	...	.....	...	.....	3	ditto ...	...	.....	...	.....	...	.....	...	...
23	Shwebo ...	ditto ...	25	21st April 1896	½	3rd July 1896	3	ditto ...	...	.....	...	.....	...	.....	...	...
24	Shwebo ...	Revd. H. M. Stockings	25	ditto ...	½	ditto ...	...	.....	...	.....	...	.....	...	.....	...	...
25	Lower Chindwin ...	Deputy Commissioner	...	.....	1	ditto ...	3	1st October 1896 ...	...	.....	...	.....	...	.....	...	...
											Baskets.					
26	Upper Chindwin ...	ditto ...	...	.....	...	.....	3	ditto ..	10	18th September 1896.	5	18th September 1896.	...	.....	...	...
27	Meiktila ...	ditto ...	100	21st April 1896	2	3rd July 1896	...	.....	...	.....	...	.....	...	.....	...	...
28	Myingyan ...	ditto ...	50	ditto ...	½	ditto ...	3	1st October 1896 ...	...	.....	...	.....	...	.....	...	...
29	Pakôkku ...	ditto ...	...	.....	2	ditto ...	3	ditto ...	...	.....	...	.....	...	.....	...	...
30	Chin Hills (Falam)...	Political Officer ...	...	.....	...	.....	3	ditto ..	10	15th January 1897.	...	.....	2	1st October 1896.	1	15th January 1897.
		Total ...	940	.....	24	.....	36	.....	22	.....	7	.....	2	.....	1	...

(a) American maize (three varieties).
(b) American tobacco (Havana and Virginia).
(c) English vegetable seeds (Sutton's).
(d) Sagaing wheat.
(e) Mandalay gram.
(f) Southern Shan States (potato).
(g) Agri-Horticultural Society, Calcutta.

STATEMENT No. IV.—*Description of seeds received, together with the cost of consignment and of distribution during 1896-97.*

Seeds.		From	Date of receipt.	Cost of consignment.	Cost of distribution.
Description.	Quantity.				
				Rs. A. P.	Rs. A. P.
Maize ...	1,000 cobs	American (D. Landreth and Sons, Philadelphia, U. S. A).	8th April 1896	495 10 0	48 12 0
Tobacco ...	24 lbs.	Ditto ...			
Vegetable ...	36 lbs.	England (Sutton and Sons)	22nd September 1896.	192 3 9	12 4 0
Wheat ...	22 mds.	Sagaing	.....	.....	.....
Gram ...	7 mds.	Mandalay	.....	.....	.....
Potato ...	2 mds.	Southern Shan States ...	1st October 1896.	9 0 0	.....
Oats ...	1 md.	Agri-Horticultural Society, India.	15th January 1897.	32 13 0	2 12 0
		Total ...	.....	729 10 9	63 12 0

STATEMENT No. V.—*Experimental cultivation—American Maize.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		LOWER BURMA.	
1	Hanthawaddy ...	.....	Report not received.
2	Tharrawaddy ...	Distributed to Rev. Father Parray, to Township Officers of Mônyo, Minhla, Gyobingauk, Tapun, and Sanywe, and to thugyi of Bilin.	The experiments were not successful, owing to late sowing and heavy rains.
3	Pegu ...	Distributed to the Manager of the Kyauktaga grant, Pyuntaza subdivision, experiments by Indian cultivators.	A large percentage did not germinate, and in consequence the yield was small. The cobs obtained were not so large as that of the American variety.
4	Bassein ...	.....	The experiments did not prove altogether successful. The plants were strong, but the grain was small.
5	Myaungmya ...	Tried at Myaungunya and Wakèma.	Failed owing to late planting.
6	Amherst ...	.....	Report not received.
7	Amherst (Moulmein)	Secretary, Agri-Horticultural Society.	The seed did not germinate as freely as was expected, owing to heavy rains.
8	Toungoo ...	Distributed to Subdivisional and Township Officers in the district.	The experiments in the Thagaya and Tantabin townships and in the town of Toungoo were successful. The plants grew up well and the cobs were as large as the original, but the grain was not so sweet as that of the country variety. In other townships the experiments did not prove satisfactory, the seed germinated but the outturn was poor.
9	Toungoo ...	Mr. J. Petley, Nancho estate, Karen Hills cultivation.	Report not received.
10	Thatôn ...	.....	Report not received.
11	Tavoy ...	Distributed to Township Officers.	The experiment in every township failed, owing to heavy rains.
12	Mergui ...	Tried by Superintendent of Jail and Subdivisional Officers, Mergui and Maliwun.	The experimental cultivation in the Mergui jail was successful, but failed in other places.
13	Salween ...	.....	Report not received.

STATEMENT No. V.—*Experimental cultivation—American Maize*—concluded.

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA.	
14	Minbu ...	Distributed to the Superintendent of Jail and some cultivators, in different parts of the district.	Results were very poor. In some places the cobs were not well filled with grain and smaller in size than those of the indigenous variety.
15	Magwe ...	Distributed to Subdivisional and Township Officers and the Superintendent of Jail.	The Subdivisional Officer, Taungdwingyi, reports that 30 cobs were distributed to six thugyis. The Yin thugyi, who took great interest in the cultivation, sowed the seed in sandy soil manured with cowdung, and he was well rewarded for his labour by being able to raise 500 cobs out of five. Cultivation in black alluvial soil by other thugyis was partially successful, most of the seed germinated, but the plants withered for want of rain. The experiment made by the Superintendent, Taungdwingyi Jail, resulted in a failure. The Township Officers, Natmauk and Magwe, reported that the seed was sown in light sandy soil, but as the cultivation depended solely on rain about only one-third of the seed germinated and the plants withered after a time. The Superintendent, Magwe Jail, reports that the experiment was tried in the jail garden and watered by hand. All the seed germinated and bore a good crop. Four cobs were forwarded for inspection.
16	Thayetmyo ...	Distributed to Suddivisional Officer, Minhla, and Township Officers, Thayetmyo, Kama, Mindôn and Myedè.	The experiments were not successful.
17	Mandalay ..	.....	Report not received.
18	Katha ...	Distributed for trial in the jail, military police, and forest gardens, and also in several townships.	Except at Tigyaing, Manlè, Banmauk, and Pinlèbu, the experiment was successful. The failure at the above-mentioned places is attributed to want of more rain.
19	Ruby Mines ...	Distributed to Subdivisional Officers.	In the Tagaung subdivision the experiment failed owing to late sowing. In Mogôk the plants grew well, but owing to the ravages of rats and porcupines, and to damage done by gales the harvest was unsatisfactory. In Momeik the seed was sown in *taungya* land and a fair crop was obtained and the grain proved to be better than that of the country variety.
20	Myitkyina ...	Grown on sandy soil, not manured or irrigated. Planted in June.	The experiment in Myitkyina proved very successful. About 500 cobs were obtained out of six cobs; but in the Mogaung subdivision the seed did not germinate.
21	Shwebo ...	Distributed to Subdivisional Officers, Shwebo, Ye-u, and Tantabin, and to the Superintendent, Shwebo Jail.	Mr. Cloney, Subdivisional Officer, Kanbalu, who personally planted some of the seed in his garden, reports that all the seed germinated and bore a few good cobs, which he kept for future trial. The seed tried in the jail garden, Shwebo, by the Superintendent, germinated and the plants grew well till the rain ceased. The highest of them measured 7 feet and on an average there were two cobs on each plant. In other parts of the district, the experiment did not succeed well on account of the early cessation of the rains.
22	Shwebo ...	Rev. H. M. Stockings ...	Report not received.
23	Meiktila ...	Distributed to thugyis and men who have gardens.	Owing to a continued drought after the seed was sown, the experimental cultivation proved a total failure.
24	Myingyan ...	.....	The experiment was tried both on dry land and on islands, but failed owing to want of rain.

STATEMENT NO. VI.—*Experimental Cultivation—Tobacco.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		LOWER BURMA.	
1	Hanthawaddy ...	.....	Report not received.
2	Tharrawaddy ...	Distributed to Township Officers.	In the Mônyo and Sanywe circles the seeds germinated, but the plants grew up lean and unhealthy. In Shabinda the experiment was a success, but in Zigôn it failed entirely.
3	Bassein ...	Distributed to cultivators through the Subdivisional Officer, Ngathainggyaung.	The experiment was a total failure in Daunggyi, but in Ngathainggyaung the cultivators obtained a fair crop and the leaves were good and strong and sold well in the market.
4	Myaungmya ...	Distributed to the Subdivisional Officers, Myaungmya and Wakêma.	The experiment tried in the Myaungmya subdivision proved a total failure, as the land selected was not suitable. In the Wakêma subdivision the seed was distributed to a few headmen, but tried only in Kathawin and Hinthatôn villages. The experiment was successful and the tobacco obtained was of superior quality. Samples of the leaves were sent for inspection.
5	Amherst ...	.....	Report not received.
6	Tavoy ...	Distributed to thugyis and village headmen through Township Officers.	The experiment was partially successful in four out of the seven villages where it was tried, but the leaves were smaller than the Native tobacco. In one township, however, the outturn was very good; 4 ozs. of seed produced 10 viss or 36·5 lbs. of leaves. The failure in three villages is attributed to heavy rains.
7	Mergui ...	Distributed to the Subdivisional Officer, Maliwun, and the Township Officer, Tenasserim.	The experimental cultivation in the Tenasserim township was a failure.
8	Salween ...	.....	Report not received.
		UPPER BURMA.	
9	Minbu ...	Distributed to the Subdivisional Officers, Minbu and Salin.	Owing to drought the experiment in both subdivisions failed entirely.
10	Magwe ...	Distributed to the Township Officers, Yenangyaung, Magwe, and Myingun.	None of the seed sown in Yenangyaung and Myingun townships germinated. In Magwe some of the seed germinated, but the plants were small and weak, and withered for want of sufficient rain.
11	Thayetmyo ...	Distributed to Subdivisional and Township Officers.	The experiment was successful in Myedê township, but failed in other places.
12	Mandalay ...	.....	Report not received.
13	Myitkyina ...	Grown on sandy soil not manured or irrigated.	The experiment was a total failure due to draught.
14	Sbwebo ...	Distributed to Subdivisional Officers.	The experiment was made at Yengôn village by a thugyi, but owing to scanty rainfall it was not very successful.
15	Shwebo ...	S. P. G. Mission farm ...	The seed germinated freely and the plants yielded large well-shaped leaves which made excellent smoking tobacco.
16	Lower Chindwin ...	Distributed to 10 cultivators	Failed almost entirely.
17	Meiktila ...	.....	Failed entirely due to the scarcity of rain during the year.
18	Myingyan ...	Distributed to four thugyis	With the exception of that in Ywathit the experiment in the other circles proved very successful, but the leaves did not come up to the size of the ordinary Burmese tobacco.
19	Pakôkku ...	.....	Report not received.

STATEMENT No. VII.—*Experimental Cultivation—English vegetable seeds.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA.	
1	Mandalay ...	Distributed to cultivators through the Subdivisional and Township Officers, Maymyo.	The result of the experiment was favourable. The following seeds did remarkably well: Cabbage, cauliflower, radish, carrots, beets, and knol-khol.
2	Katha ...	Distributed to the Subdivisional Officers, Wuntho and Banmauk, and Battalion Commandant, Katha.	In Wuntho itself the experiment was a failure, but in Kawlin and Singôn (Kawlin subdivision) results were satisfactory. In Banmauk and Katha also the experiment was a success.
3	Ruby Mines ...	Distributed in the three subdivisions, Tagaung, Momeik, and Mogôk.	The experiment failed in Tagaung. In Momeik all the plants grew up well, except onion, and in Mogôk excellent results were obtained.
4	Myitkyina ...	Grown on rich loam soil, irrigated by hand with river water.	All kinds of plants came up very well, except cabbage which failed entirely.
5	Bhamo ...	.....	Report not received.
6	Sagaing ...	.....	The results obtained have been more satisfactory this year than that of the previous year. Raddish, lettuce, and knol-khol did best. Beet, carrot, and cabbage were small, but of good flavour. Cauliflower and broccoli grew up well, but never flowered. The failure of obtaining very good results is attributed to the short period of rainfall.
7	Shwebo ...	Distributed in the various parts of the district.	Tomatoes and khol-rabi turned out most successful. Celery, water-melon, asparagus, and strawberry failed. The experiment with other seed succeeded fairly.
8	Lower Chindwin ...	Distributed to persons who take an interest in the cultivation in Budalin and Paiè subdivisions.	In the Budalin subdivision the experiment was a success, except asparagus and water-melon, which were destroyed by rats. In the Paiè subdivision the experiment failed entirely as the crops were destroyed by insects.
9	Upper Chindwin ...	Grown on dry soil near river bank and watered by hand.	Very fair crops obtained throughout.
10	Myingyan ...	Distributed to the Subdivisional Officers and Superintendents, Myingyan and Pagan Jails.	The experiment tried in the Myingyan subdivision failed, owing to continued drought. The Superintendent of Jail reports that, with the exception of peas, beans, water-melon, asparagus, turnip, celery, and onion, the experiment succeeded fairly. In Pagan all plants grew up well, except cauliflower.
11	Pakôkku ...	Distributed to the Subdivisional Officer, Pauk, Township Officer, Yesagyo, and the Superintendent, Pakôkku Jail.	All the plants appear to have grown successfully in these places, except water-melon and asparagus.
12	Chin Hills (Falam)	Distributed through the Political Officer.	Marrows and ridge-cucumbers did exceedingly well. Strawberries did as well as can be expected, but their cultivation requires some knowledge and care. In the absence of the Assistant Superintendent who was out a great deal in the cold and dry seasons, men of no experience were in charge of the gardens.

STATEMENT No. VIII.—*Experimental Cultivation—Wheat.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA.	
1	Myitkyina ...	.....	Report not received.
2	Upper Chindwin ...	.....	The experimental cultivation yielded no results. The plants sprang up fairly well at first, but were all seriously damaged and killed by drought.
3	Chin Hills (Falam)	.....	Report not received.

STATEMENT No. IX.—*Experimental Cultivation—Gram.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA.	
1	Ruby Mines ...	.....	Report not received.
2	Upper Chindwin ...	.....	The experimental cultivation yielded no results. The plants sprang up fairly well at first, but withered for want of rain.

STATEMENT No. X.—*Experimental Cultivation—Potatoes.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA.	
1	Chin Hills (Falam)...	Distributed through the Political Officer to Haka Chiefs, Chin cultivators, and to Gurkha settlers about the hills.	Haka Chiefs did not plant the seed given them. The result of the experiments made by the Chins was bad owing to their not protecting the plants from the village pigs. Gurkha settlers were successful in raising a double crop this year. The Superintendent again reports that English red-field potatoes would be the best for the soil and climate of the hills; but none of this variety is procurable in India.

STATEMENT No. XI.—*Experimental Cultivation—Oats.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA.	
1	Chin Hills (Falam)...	.....	Report not received.

G. B. C. P. O.—No. 4249, D., I. R. & A., 17-11-97—235.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1897-98.

RANGOON: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, BURMA. NOVEMBER 1898.

[Price,—Re. 1-0-0.]

TABLE OF CONTENTS.

REPORT ON THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BURMA, FOR THE YEAR 1897-98.

SECTION I.

Prefatory.

	Para.	Page.
Officers who held charge of the department ...	1	1
Tours of Director and Assistant to Director ...	2	ib.

SECTION II.

Land Records Establishments.

Creation of an important charge by formation of the new Thatôn district ...	3	2

SECTION III.

Utilisation of Land Records.

Preparation of township books ...	4	2

SECTION IV.

Scientific and National Enquiry under Imperial control.

Survey work done by department ...	5	2
Economic products supplied to Reporter on Economic Products ...	6	ib.
Remarks on the Civil Veterinary Department ...	7	ib.
Registration of land trade between Burma and adjacent States ...	8	ib.
Crop-cutting statistics ...	9	3

SECTION V.

Scientific and Local Enquiry under Provincial Direction.

Experimental cultivation in the Shan States ...	10	3
Distribution of seed for experimental cultivation ...	11	ib.

SECTION VI.

Agricultural Education.

Qualifications necessary in a Revenue Surveyor or Inspector ...	12	4

SECTION VII.

Publication of Agricultural information.

Analyses of famine statistics ...	13	4
No papers communicated to other provincial departments ...	14	ib.

SECTION VIII.

Final.

Remarks on working of the department ...	15	4
Forecasts of exportable surplus rice ...	16	ib.

APPENDICES.

	Page.
Appendix A.—Report on experimental cultivation in the Southern Shan States for the year 1897-98. ...	iii.
Statement A.—Actual total of receipts and disbursements from the 1st June 1897 to the 31st May 1898 ...	ix.
Statement B.—Details of disbursements from the 1st June 1897 to the 31st May 1898 ...	ib.
List of Fruit-trees in Orchard, 1897 ...	x.
Statement No. III.—Distribution list of seed obtained for experimental cultivation during the year 1897-98 ...	xv.
Statement No. IV.—Description of seeds received, together with the cost of consignment and of distribution during the year 1897-98 ...	xvii.
Statement No. V.—Experimental cultivation—Ground-nut ...	ib.
Statement No. VI.—Experimental cultivation—Tobacco ...	xviii.
Statement No. VII.—Experimental cultivation—English vegetable seeds ...	xx.
Statement No. VIII.—Experimental cultivation—Carrot ...	xxi.
Statement No. IX.—Experimental cultivation—Castor-oil seed ...	ib.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1897-98.

SECTION I.

PREFATORY.

MR. T. C. Wilson, I.C.S., held charge of the Department of Land Records and Agriculture until the 11th March 1898. From that date until the close of the year Mr. Wilson officiated as Revenue Secretary to the Government of Burma, Mr. M. Laurie, I.C.S., officiating as Director.

Mr. R. A. Gibson, Superintendent of Land Records, 2nd grade, acted throughout the year as Assistant to the Director in succession to Mr. J. C. Clancey, Superintendent, 1st grade, who had proceeded on furlough on the 21st June 1896.

The following changes occurred during the year among the Superintendents and Probationers: Mr. Biggie, a Survey of India Officer, who was seconded for service in Burma, reverted at his own request, to the Survey Department, with a view to entering the service of the Siamese Government. Mr. E. Bell was reduced from Superintendent to Probationer. Mr. Torrens (junior), Probationer, was drowned in November 1897 in a boating accident off the coast of Mergui. Messrs. W. C. Godfrey, D. O'Hara, and R. S. Carrapiett, B.A., were appointed to the department, the first two as officiating Probationers and the last-named as officiating Senior Inspector.

On his return from furlough in April 1898 Mr. C. J. Ford, Superintendent, was posted to the newly created district of Thatôn.

Tours of Director and Assistant to Director.

2. During the months of September and October 1897 the Director, Mr. Wilson, visited the headquarters of the Pegu, Tharrawaddy, Prome, Henzada, Thatôn, Amherst, and Thayetmyo districts and inspected the Land Records offices and survey schools at those centres. He also inspected the Land Records offices at Thatôn and Thayetmyo, where there are no schools, and the survey school at Toungoo, where there is no Land Records office. In November 1897 he inspected the Land Records office of Hanthawaddy and in January and February 1898 the supplementary survey field-work of Thatôn, Hanthawaddy, and Tavoy, in the last of which he specially examined the re-classification of gardens which was in progress in the district. The Land Records office and survey school at Tavoy were inspected at the same time. The Director inspected the headquarters offices, the supplementary survey field-work, and the survey schools of Mandalay and Kyauksè in December 1897. The Toungoo settlement office work was inspected in September 1897 and the field-work in March 1898. Mr. Wilson inspected the revision settlement operations, which were started in the year, of the Hanthawaddy district, in March 1898, while Mr. Laurie, Officiating Director, inspected the Bassein revision settlement in April 1898. The Myaungmya revision settlement was inspected after the close of the agricultural year.

Mr. Gibson, Assistant to the Director, during the season inspected the Land Records offices and survey schools at Akyab, Kyaukpyu, Thôngwa, Bassein, Myaungmya, Minbu, Shwebo, Meiktila, and Yamèthin, and the survey school of Sagaing. He also examined supplementary survey field-work in Akyab, Kyaukpyu, Hanthawaddy, Thôngwa, Bassein, Myaungmya, Thayetmyo and Minbu, the special local surveys of the Tandawgyi and Mindôn valleys in the Pegu and Prome

districts respectively, and the revision survey work of Bassein, besides carrying out an experimental supplementary survey on a new system in Minbu.

SECTION II.

LAND RECORDS ESTABLISHMENTS.

3. This subject is fully dealt with in the Revenue Administration Report. No changes were made in the number of Superintendents and Probationers in Upper Burma. In Lower Burma an important charge was created in consequence of the formation of the new Thatôn district. The number of Inspectors was increased by three in Lower Burma and seven in Upper Burma. No change has been made in the method of recruitment of the subordinate establishment, but the rule alluded to in paragraph 4 of last year's report requiring that an Inspector shall possess a seventh standard qualification has been brought into force.

SECTION III.

UTILIZATION OF LAND RECORDS.

4. Township books continue to be prepared by Superintendents of Land Records in districts under supplementary survey. They have been examined when possible by the Director, and they have been found in almost all cases to have been carefully and intelligently prepared. No marked changes in agricultural conditions have hitherto been brought to light through the medium of these books, nor is it to be expected that changes other than mere seasonal changes would occur rapidly. For the present the particular usefulness of these compilations lies in the fact that they, in combination with the famine analysis, afford to revenue officers an easy and trustworthy source of information and a rapid means of becoming acquainted with a district.

SECTION IV.

SCIENTIFIC AND NATIONAL ENQUIRY UNDER IMPERIAL CONTROL.

5. The work done by the Department of Land Records in connection with surveys is described in detail in the Land Revenue Administration Report. For the Meteorological Department the usual compilation of locally collected statistics of rainfall has been made in this office and the customary annual report has issued.

6. The following statement gives a list of the various economic products collected for, and supplied to, the Reporter on Economic Products :—

Economic Products sent for the Indian Museum, Calcutta, and Imperial Institute, London.

Name.	Description of specimen sent.	From where obtained.
Botanical.		
Carthamus tinctorius	Seed, plants in full blossom...	Prome, Thayetmyo, Sagaing, Kyauksè, and Minbu districts.
Safflower	Plant and seed	Magwe and Pakôkku districts.
Acacia suma	Fibre	Western Forest Circle, Upper Burma.
Maoutia puya	Bark	Western Forest Circle, Upper Burma.
Calotropis procera	Fibre	Mandalay district.
Oriza sativa (wild species) ...	Plants and seed	Myaungmya and Thôngwa districts.
Æschynomene aspera	Dried specimens of pith ...	Attaran, Amherst district.

7. The usual annual report in connection with the Civil Veterinary Department has issued, and the subject of veterinary work has also received attention in the Revenue Administration Report.

8. The registration of land trade between Burma and adjacent States was continued during the year, and the annual report on the subject has issued. The registration of trade between Upper and Lower Burma having been discontinued,

this Department is unable to give information regarding the movements of food-grains in the province. The tabular statement which appeared on page 5 of the report of this department which issued last year is therefore omitted.

9. Crop-cutting statistics were received during the year and are in process of compilation. The crop-cutting tests in Upper Burma are much more difficult to conduct on account of the varied nature of the crops, and frequent mistakes are made by district officers. The experiments made in Lower Burma are easier, being confined mainly to paddy, and the statistics collected in recent years have been of use to Deputy Commissioners and others who have had to prepare forecasts for revisions of settlement in their districts. The usual monthly notes on food-supply have been regularly published.

SECTION V.

SCIENTIFIC AND LOCAL ENQUIRY UNDER PROVINCIAL DIRECTION.

10. The report submitted by the Superintendent of the Southern Shan States on the subject of experimental cultivation forms an appendix to this report. The experiments in fruit culture are still attended with fair success, and the locality and soil seem also to be peculiarly adapted for vegetables. The cultivation of wheat is no longer an experiment. It has been established that wheat will grow well in the Shan States. A point that still remains somewhat doubtful is whether wheat-seed can be stored in the Shan States during the rains. It is regrettable to have to record that Mr. Carey's remarks regarding the energy and business-like methods of the successor to the Yawnghwe *Sawbwa* have to be to a certain extent discounted. The successor to the Yawnghwe *Sawbwa* failed to reserve a sufficient quantity of seed-wheat for sowing in the winter of 1898-99, and over a lakh of pounds of wheat had to be procured from the North-Western Provinces and forwarded to Mr. Carey at considerable expense, and at the cost of an incalculable amount of worry to all concerned. Further opinions have been taken regarding the quality of Shan wheat, and correspondence has passed on the subject of the possibility of bringing it into the open market. The remark made last year still holds good, namely, that the cost of transport to Rangoon is prohibitive. Over nine lakhs of pounds of wheat had been supplied by Mr. Carey to the Commissariat Department by the first week in June. It was hardly expected, however, that the 10¼ lakhs required by the Commissariat would be made up. The shortage is attributed to the seed having been sown as late as the end of November and in December and January. There is no reason this year apparently why all the sowing should not be completed within the month of November. Financially the experiment was a success during the year under report; not only on account of certain small incidental profits made by the collecting agency, but also, and principally, to the cultivators themselves.

11. The statements in the appendices show the distribution of seed for experimental cultivation during the year. A large supply of surplus carrot seed was furnished by the North-Western Provinces and was distributed to many districts in Upper and Lower Burma. The general results in Lower Burma were not encouraging and in the dry zone of Upper Burma the experiments were also unsuccessful. In those districts of Upper Burma in which the winter is fairly cold and the soil moist, the results were satisfactory. The experiments, as far as they go, do not tend to show that the crop would be a useful source of food-supply in time of famine. The experiments in the cultivation of groundnuts were not a direct success. It is reported, however, from another source that the cultivators in the southern portion of the Magwe district are taking an interest in groundnut cultivation and that the area under that crop is likely to extend. The experiments with Havana tobacco seed were not on the whole successful. The most promising results were obtained in the two southern districts of the province, Tavoy and Mergui, and this fact may possibly be a guide when future experiments are made. The final results of the experiments with the castor-oil plant are not yet known.

SECTION VI.

AGRICULTURAL EDUCATION.

12. In the report for the year 1896-97 the qualifications necessary for becoming a Revenue Surveyor or an Inspector were described in detail. These qualifications did not include a knowledge of agriculture, and no definite alteration in the direction of requiring an agricultural qualification has been made during the year. The question of requiring Survey Teachers to possess a higher qualification in general education is under consideration. As regards the extension of agricultural teaching in the province, a certain amount of progress has been made. A hand-book of agriculture has been issued; and the Sub-Committee of the Text-book Committee which was appointed to prepare a set of elementary science readers in Burmese finished its work.

Parts I and II of the adaptation of Murche's Science Primers have been translated, and Part III is in the press.

SECTION VII.

PUBLICATION OF AGRICULTURAL INFORMATION.

13. The famine analyses received during the year were scrutinized on receipt and were almost without exception returned to local officers for amendment and revision. The general tendency of officers is to take too favourable a view of their districts, and several analyses were returned for reconsideration on this account, 17 analyses have been passed and printed, and 3 analyses are still under revision with local officers.

No papers were contributed by the provincial Agricultural Department or through its agency.

The following papers were received during the year from other provincial departments:—

(i) Note on the cultivation of black pepper in Assam.
(ii) Report on the working of the Horticultural Gardens at Lucknow.
(iii) Note on the mustards cultivated in Bengal.
(iv) Monograph on cotton fabrics produced in the North-Western Provinces and Oudh.
(v) Monograph on cotton fabrics produced in the Bombay Presidency.
(vi) Monograph on woollen fabrics in the Hyderabad Assigned Districts.

14. No papers were communicated to other provincial departments.

SECTION VIII.

FINAL.

15. The department continues to deal with the subjects mentioned in paragraph 17 of the Report for 1896-97. The amount of inspection left undone was greater than in the preceding year. Distances are great and in some cases the means of communication slow and intermittent, and the time occupied in accomplishing an inspection appears frequently to be excessive. With twenty-four districts under supplementary survey, with seven settlements, several local surveys and *quasi* settlements, a complete annual field inspection is, as the department continues to grow, becoming almost a physical impossibility.

16. The forecasts of the exportable surplus of rice were issued as usual during the year. The weight of the paddy per basket in the mills at Bassein, Akyab, and Moulmein has been ascertained. The exportable surplus was estimated at 1,930,000 tons of cargo rice. The practice of storing rice for several months before taking it to market appears to be coming into favour, and it is on that account difficult to obtain the complete figures for the exports of the year in time for this report. Even now many of the rice-mills are busy milling last season's crop. The actual export up to date, as far as can be ascertained, is 1,650,000 tons.

M. LAURIE,
Offg. Director of the Department of Land Records and Agriculture.

RANGOON:
The 20th October 1898.

APPENDICES.

APPENDIX A.

REPORT ON EXPERIMENTAL CULTIVATION IN THE SOUTHERN SHAN STATES FOR THE YEAR 1897-98.

INTRODUCTORY.

IT is now eleven years since the occupation of the Shan States, and the year under report is the seventh in which experimental cultivation has been undertaken.

In writing this report I am placed at a very great disadvantage both as regards myself and as regards the results of the experiments, for I have to report on the trees which another has planted, on the grafts which another has set under peculiar circumstances, and on arrangements which he adopted in view of his past local experiences. Mr. A. H. Hildebrand started the orchard and gardens and has given them his liveliest attention and care, and has watched the young cuttings grow into trees and knows the peculiarities of soil and climate which have affected each species in the past. I relieved Mr. Hildebrand last November, and naturally have spent the last six months on tour in my charge, and consequently I have had only time to pick up the threads of the agricultural schemes without being able to devote the time and attention to the matter which is at all times necessary, but more especially so when the Overseer in charge of the gardens is a half-trained man and, furthermore, a Burman, whose happy-go-lucky nature renders it the more imperative that his every experiment be supervised most closely.

As regards the orchard itself, I feel that, as a *locum tenens*, I have no right to alter any existing arrangements, and I shall, in the future, as during the last six months, content myself with continuing the arrangements which I find in force without attempting changes or new experiments of which Mr. Hildebrand might not approve.

GRANT AND ESTABLISHMENT.

Grant.—The grant for the year was Rs. 5,670 or Rs. 830 less than that of the previous year. The total receipts from experimental cultivation this year are Rs. 5,942-15-1 against Rs. 4,558-14-11, an increase of Rs. 1,383-0-2. The only outstandings still due are Rs. 46 for vegetables, and Rs. 6 for potatoes.

Statement **A** gives receipts and expenditure. Statement **B** gives details which show a good result, *i.e.*, that Rs. 3,125 only has been expended, whilst Rs. 5,941 has been obtained by sale of produce and entirely exclusive of the grant.

Establishment.—The establishment includes an English clerk from the office, who receives Rs. 10 per mensem for attending to the English writing, label-marking, &c. There is a Burman Overseer on Rs. 40, two gardeners on Rs. 14, and four under-gardeners on Rs. 12. There are three Government carts and five bullocks for use in the garden. One of the bullocks was carelessly lost by the little boy who herds them under circumstances which rendered it impossible to recover compensation either from the State or from the boy's pay.

Classification of experimental cultivation.—It will be convenient to classify the experimental cultivation into four groups, (*a*) orchard, (*b*) vegetable garden, (*c*) wheat cultivation, (*d*) flowers, and to deal with each separately, except in the matter of final accounts.

THE ORCHARD.

Situation of orchard: its altitude, aspects, soil, and vegetation.—The orchard is situated within the limits of the Civil station of Taunggyi; it is 41 acres is extent; the highest altitude which it attains is 4,800 feet, whilst the lowest point is 70 feet less. The orchard is oblong in shape, the north and south ends having south and north aspects, and the east and west aspects are well represented.

The site presents, besides other advantages, that of being at the head of a valley, and during the rains a small stream runs from east to north-west through the grounds. It is most unfortunate that this stream is not perennial. The land from the four boundaries slopes easily to the bed of the small stream, and the valley of the stream being even and the ground rich and fertile, it is most valuable for strawberry-beds and orange trees.

On the east boundary and rising to a height of 700 feet above the orchard is a limestone cliff forming part of a ridge which runs from north to south—the usual mountain formation of the Shan States. The soil of the orchard is a clayey marl, coloured red with an oxide of iron, and is composed of the disintegrated fragments of the limestone ridge just described.

The natural vegetation found in the orchard is a coarse rank grass mixed with bracken and weeds, amongst which wild raspberries of two species and the wild gooseberry (*phyllanthus*) flourish. Close under the cliff evergreen jungle is found, but this does not now extend into the valley, presumably having been cut down in the past to make way for cultivation.

Manures.—No experiments have been made with manures. The orchard and garden, and strawberry-beds have been manured with 460 cart-loads of cow-dung collected in the cattle-pens of the surrounding villages, and a little *ngapi* was used in the asparagus beds.

Irrigation.—In addition to the spring which dries up at the close of the rains, the strawberry-beds and orange trees are irrigated from a water-channel which inducts water into the Civil station from a spring close on 2 miles distant, and which is brought along the east boundary of the orchard.

Fencing and road-making.—The orchard is surrounded by a quick-set fence of a species of *zizyphus* called locally *subo*. It is at once pleasing to the eye, quite impenetrable by cattle of all sorts, and now that it is properly grown, it costs absolutely nothing to maintain. In past years Mr. Hildebrand supplied excellent teak gates and cut the necessary roads, and so this year there has been no expenditure in these directions.

Climate and temperature.—The altitude of the Taunggyi orchard garden is about 4,800 feet. It lies in 20° 45′ north latitude, and 97° east longitude.

The temperatures recorded for the different months from June 1897 to May 1898 are as follows:—

Month and year.	Mean maximum.	Mean minimum.	Mean of month.
June 1897	79·33°	65·12°	72·22°
July "	76·54°	63·78°	70·16°
August "	75·52°	64·17°	69·84°
September "	77·67°	62·70°	70·19°
October "	77·68°	61·58°	69·73°
November "	73·55°	54·16°	63·85°
December "	71·74°	47·53°	59·63°
January 1898	72·08°	43·02°	57·51°
February "	76·57°	47·05°	61·81°
March "	83·52°	52·28°	67·90°
April "	85·02°	61·11°	73·06°
May "	80·08°	61·0°	70·54°
Mean for the whole year ...	76·60°	56·95°	67·20°

The mean annual temperature of Sydney is 65·8° and of Alexandria 69·0°; the mean annual temperature of Taunggyi is 67·20°, thus lying midway between the two. Its temperature very nearly approximates to that of Madeira, which is 66·0°. Taunggyi is 14 degrees cooler than Bombay and 15 degrees cooler than Mandalay and Calcutta, while it is nearly 17 degrees hotter than London. The prevailing winds throughout the year are southerly, south-westerly and south-easterly. North winds are exceedingly rare and the orchard is completely protected from east winds by a high range of limestone cliffs.

The rainfall for the different months was—

June 1897	3·04
July "	7·88
August "	13·47
September "	12·07
October "	6·46
November "	1·91
December "	0·29
January 1898	0·14
February "	...
March "	...
April "	2·73
May "	7·18
Total ...	55·17

The most rainy day was the 15th September 1897, when 2·34 inches of rain fell.

Contents of orchard.—The orchard contains at the present moment, excluding trees for sale and distibution, the following live trees:—

Apple trees	900
Pear	1,072
Plum	176
Peach	130
Apricot	65
Nectarine	93
Cherry	117
Quince	5
Mulberry	1
Grape vines	14
Fig	25
Currant	10
Gooseberry	1
Nut (walnut, cobnut, filberts)	28
Total ...	2,637

I will now deal with each species in the order above given.

Apple trees.—Mr. Hildebrand in last year's report gave at considerable length an account of how he tried to graft the cultivated apple on the indigenous tree *Docynia Indica*, how he had failed, and how Sir George King had explained to him that the stock *Docynia Indica*, though allied to *Pyrus malus*, the true wild apple, is yet distinct and not a true apple. Mr. Hildebrand expressed his intention to prosecute his attempts, altering and changing his methods so as to tempt the graft to live. The result of this season's experiment cannot be considered as encouraging, for, out of 1,363 grafts, 386 only are alive at the present moment, and this great mortality has taken place in four months, for the grafting was done in January and February this year. At the same time of the 130 grafts which survived last year out of the 856 cases, over 100 are still alive, and furthermore, some of the grafts 1895 and 1896 still live and look well. It is true that none have flowered or fruited, but it promises well that they still live and look healthy. Everyone will sympathize with Mr. Hildebrand in his desire to use the strong, quick-growing, indigenous tree which needs no acclimatization for his stock, but personally I should feel disposed to accept Sir George King's verdict as final and I would condemn the *Docynia Indica* as the main stock on which to operate. I should continue to experiment on it annually, but I should look to imported trees to supply the stock from which Shanland in the future will raise its apples for export. However, I have no right to criticise or to offer an opinion. I have had little experience of apples in the East and still less of the tree called *Docynia Indica*, and it cannot be considered that Mr. Hildebrand's experiments have yet been proved a failure.

Pears.—There are 1,072 pear trees living. Out of 723 grafted during the year, 542 are living. The trees are still young and have not so far borne fruit.

Plums.—Of the 130 plum trees two are now fruiting and many are expected to do so next year.

Peaches.—Twenty-one peach trees bore fruit this year, and at the beginning of May several of them looked magnificent, being heavily weighted with most lovely coloured fruit, but the crop was a total failure, for, though a quantity of fruit came to the table, it was bitter or tasteless and much damaged by insects. The reason of this is that we had no moderate showers, but tremendously heavy storms in April, and then only occasionally. The fruit was consequently damaged both by too much rain and by too long intervals between the rainfall. Another year I should feel disposed to water the trees in April and May if the rains hold off as they did this year.

Apricots and nectarines.—The growing trees look very well, but so far have not borne fruit.

Cherry.—The cherry trees are for the greater part grafts on the indigenous stock. The trees promise well in the future.

Quince—Have not yet borne fruit.

Mulberry.—The mulberry tree has not yet done anything, but hopes are maintained for its future.

Grape vines.—The grape vines are doing no good at all. Seven came from England and seven from Almorah; none are doing more than living. I should feel inclined to try them on higher land, and I should also feel inclined to try the Cashmere vines and also the species which is found at Mandalay.

Figs.—The figs were originally brought out from England. They do well and bear good fruit, but they are much attacked by a beetle, a species of longicorn, which bores into the wood and burrows down the stems, killing the branches attacked.

Currant.—The currant trees have died off and are reduced from 25 to 10. They do not promise well.

Gooseberry.—The gooseberry trees, which originally numbered 10, have now become reduced to one solitary tree, which is doing but very little good.

Nuts.—The nut trees are doing very little good. The walnuts alone promise to do anything in the future.

Orange trees.—Orange trees are of course no experiment in the Shan States, though they are new to Taunggyi. The trees came from the best orange tract in Mawkmai. The trees are only four and five years old; they look to be in a capital state and some have borne flowers. We have yet to learn whether oranges from Mawkmai, accustomed to a climate similar, it is said, to Moulmein, will do well at this altitude, which may prove too high, too cold, and too dry for this peculiar species.

Strawberries.—The strawberries have done excellently this year. There has been no difficulty about irrigation and nothing has interfered with them. The four beds commenced to fruit in December, and at the date of writing they are not completely over, though the rain has spoilt their flavour.

I did not sell the fruit this year as the contributors to the vegetable garden did not regularly get their money's worth, due to the easing off of the overseer's energy as soon as Mr. Hildebrand had left the district and I had started on my lengthy tours.

Raspberries.—Three species of raspberries and one of blackberries are indigenous and all do very well, but Mr. Hildebrand reported on these last year.

Potatoes.—Potatoes must be included in orchard produce as they are grown in the orchard between the fruit trees or in ground which is intended, and which they prepare, for the reception of fruit trees. The seed used is a kidney, which does most excellently up here. The first crop of 988 viss of potatoes was planted at the very end of April and the outturn was 4,000 viss dug at the end of August. Besides this expected crop there was an unexpected crop which started from tubers left in the ground in the previous year, when the crop was so carelessly dug that this year the undug potatoes produced a crop of no less than 8,844 viss. The potatoes were disposed of by sending 7,300 viss to Thazi for sale, 1,696 viss were kept for local sale, whilst 3,000 viss were sent to the Myelat and 100 viss to Kēngtūng for distribution to cultivators.

For 1,800 viss Rs. 18 per 100 viss was realized; for 3,086 viss Rs. 13-8-0 per 100 viss was accepted; whilst 1,725 viss were disposed of at Rs. 12-8-0. It has always been a difficult matter to dispose of the superfluous crop, and this year we have to record a loss of 689 viss, which were lost or went rotten owing to the transfer of the officer in Burma who had undertaken to dispose of our crop for us.

Besides the potatoes disposed of as stated, 850 viss were kept for seed and were put down during the first week in October, and were dug at the end of February, yielding 965 viss. Of this quantity 760 viss were planted as seed in April and is now in the ground. Although 965 is not the yield which was expected from 850 viss of seed, yet the seed did increase in the ground, whilst it would have decreased in the godowns.

The potatoes which we grow are magnificent, and it is a thousand pities that we have such a wearisome task in realizing cash for the large quantities which we export to Burma. I hope to make arrangements with a broker for next year and thus have less trouble in the future than has been experienced in the past.

THE VEGETABLE GARDEN.

The vegetable garden is a plot of land south of the station, which lies alongside a spring, and which, until Mr. Hildebrand reclaimed it, was a swamp through which cattle could not cross. The soil is black and rich, but has not fully recovered from the effects of a flood which some few years ago swept away all the surface-soil of the garden. A gardener is in charge of the vegetable garden, who is supervised by the overseer. There have been some complaints from the inhabitants that they did not get enough vegetables for their money, and I blame the overseer, Maung Se, entirely for this. I find that Mr. Hildebrand speaks of him in eulogistic terms in former reports, but I have found him apathetic in every matter except tree-grafting, and conclude that he is taking his holidays whilst his master is taking his furlough. All kinds of vegetables grow and flourish here; it only requires that seed be put in the ground and sometimes watered. It is a wonderful place for vegetables. Of the vegetables I need only mention rhubarb, which is doing well, Jerusalem artichokes, which are doing badly, and asparagus, which are a proved success.

WHEAT.

The growing of wheat in the Shan States, although not unknown in the past, had been abandoned for some years, when Mr. Hildebrand in 1891-92 compelled some cultivators sorely against their will to put down 48 baskets of seed; the next year he induced them again to sow 174 baskets. A market was found for the crop in the Commissariat Department at Fort Stedman, but the industry has had varying fortunes and a few years back nearly succumbed entirely, for there arose difficulties with the Commissariat Department about taking over the crop; and then a bumper crop, which was in excess of local requirements, could not be disposed of as it was too far and too costly to transport wheat to Burma.

However, Mr. Hildebrand managed to struggle along, and finally the Commissariat Department was ordered to take the annual crop, and there has been no more difficulty on this score, though it is hard to arrange that the crop should not be more than the people can sell to the Commissariat Department and not less than the Commissariat Department requires for the garrison.

This season's crop was arranged for as in previous years by Mr. Hildebrand. He bought 1,350 baskets of the last year's crop from the local cultivators at Rs. 4 per 107 lbs. and this grain he distributed for seed for this year's crop on the understanding that grain and not money should be returned; and this grain I have received and sold to the Commissariat Department at Rs. 6 per 105 lbs., and have thus made a profit of Rs. 2,700 *minus* Rs. 921-8-0 expenses, which gives a net profit of Rs. 1,778-8-0, which has been credited in the treasury.

A heavy rainfall in October and November spoilt the early sowing and prevented general sowing till the end of November, December, and January, which is certainly too late and which slightly affected the outturn of the crop. The grain (*doodia*) has been imported from the North-Western Provinces and has succeeded well where the Ava wheat did very indifferently.

The crop this year was lighter than that of last year, but was an average crop when compared with the results of the past seven years. The grain was in some instances

shrivelled, and the upper part of the ear in the case of some fields did not fill. The fields were treated as heretofore, irrigation being resorted to when water was required, and the shortage is undoubtedly due to the crop being by force of circumstances put in late.

On the date of writing this report 913,120 lbs. of wheat have been delivered to the Commissariat Department, and more will be supplied; but the requirements, *i.e.*, 10¼ lakhs, will not be met, I fear. This is due to the shortage on estimated outturn. We have to be very careful that the people do not sow too much, for the surplus stock is left on their hands, there being no purchaser, except the Commissariat Department.

Besides the Rs. 1,778-8-0 which we have made out of the wheat crop by supplying seed, we also made Rs. 1,659 clear gain by buying the wheat by the basket from the cultivators and selling it by the pound to the Commissariat. In this year's accounts also are credited Rs. 1,118, the balance of seed-money due and not collected last season.

Mr. Hilderbrand as far back as 1893 wrote that he hoped to get the cultivators to take the business of wheat-growing into their hands, but it has not been possible to do so until now. This year the Lieutenant-Governor expressed the hope that the Superintendent would be able to induce the people to relieve him (the Superintendent) of his labours, as there were many great objections to the Superintendent performing the part of a broker between the people and the Commissariat Department, and also the responsibility was very great, for the people only grew wheat on the distinct understanding that the Superintendent would take the crop off their hands. Again, it has been most unsatisfactory that the Treasurer should be absent from the treasury for weeks in the year superintending the growing of wheat and the disposal of the crop. Last year the *Sawbwa* of Yawngwe died, and his successor is a man filled with energy and who has learnt business ways during an eleven years' sojourn in Burma, and who is anxious to use his energy and his knowledge in the interests of his purse. Consequently I looked on him as the best person to relieve the Superintendent of the business, and a few conversations convinced him that money was to be made and he accepted the terms under which I made over the industry to him. The arrangement has been accepted by the Commissatiat Department and approved of by the Government, and although Mr. Hildebrand will miss the handsome profit which the wheat crop has brought to the Experimental Cultivation accounts in the past, he must be delighted to have got rid of a duty which has at all times been most tiresome, and, at the same time, a source of great anxiety, and he cannot but congratulate himself that, in spite of the many difficulties which he has had to encounter, the experiment in wheat has succeeded so grandly that after seven years it has been found possible to make over the industry to the natives, no longer in any experimental stage, but as a recognized crop of the country.

I have addressed the Director of Land Records and Agriculture, requesting him to show a sample of the wheat which I forwarded to the grain-dealers in Rangoon, and I am, in the *Sawbwa's* interests, aiming at the exporting of wheat to Burma. Messrs. Steel and Company have recently written praising the quality of the wheat, samples of which have been sent to England and favourably criticised, and they express the hope that we will push on the industry, but the price which they offer is at least 14 annas per 105 lbs. too low for us to get it to the railway (100 miles) at the present time. When a railway taps Shanland, there should be no difficulty in growing wheat and selling it to the Rangoon dealers at a price which will pay both cultivator and dealer.

I have received sanction to start wheat-growing in distant Kēngtūng. It should succeed there as it has done here. If it does, the cost of transporting wheat for a full regiment over some 350 miles of cart and mule road will be saved, which renders the new experiment one of considerable interest to Government.

FLOWERS.

The following annuals and perennials have been grown. All succeed well, and many are most luxuriant:—

Roses.	Asters.
Geraniums.	Lobelia.
Chrysanthemums.	Convolvulus.
Violets.	Sunflowers.
Heliotrope.	Snap-dragon.
Bigonias.	Everlastings.
Pansies.	Coreopsis.
Verbenas.	Sweet William.
Nasturtiums.	Portulaca.
Canary creeper.	Zinnias.
Dahlias.	Mignonette.
Hollyhocks.	Daisies.
Phlox.	Wall-flower.
Pinks.	Fuchsia.
Carnations.	

Conclusion.

In conclusion I am able to show that the Experimental Cultivation has been this year most inexpensive, and to report that a magnificent orchard exists, from which it is hoped that the whole district will be supplied with fruit trees in due course.

The vegetable and flower gardens are of great local pleasure, whilst the wheat cultivation has already been a boon to the people and a saving of expenditure to Government.

I acknowledge the services of Maung Po Mya, Treasurer, who has been in charge of the wheat crop and arrangements now for many years and who has worked this year just as well for me as Mr. Hildebrand has annually reported that he has done for him. Maung Bwa, clerk, has taken pains with orchard accounts and affairs.

B. S. CAREY,
Offg. Superintendent and Political Officer,
Southern Shan States.

TAUNGGYI:
The 7th June 1898.

STATEMENT A.—*Actual total Receipts and Disbursements from the 1st June 1897 to the 31st May 1898.*

Receipts.	Amount.	Disbursements.	Amount.
	Rs. A. P.		Rs. A. P.
(1) By sale of vegetables ...	212 11 6	(1) On orchard	2,134 5 9
(2) By sale of potatoes ...	1,173 11 6	(2) On garden	236 14 6
(3) By sale of wheat ...	4,555 8 1	(3) On potatoes	753 10 0
		(4) On wheat	0 4 0
		Total expenditure ...	3,125 2 3
		Balance ...	2,816 12 10
Total ...	5,941 15 1	Total ...	5,941 15 1

NOTE.—The budget allotment for the year was Rs. 5,670 and has not been touched.

STATEMENT B.—*Details of Disbursements from the 1st June 1897 to the 31st May 1898.*

Details.	Amount.
	Rs. A. P.
Establishment	1,509 8 0
Cost of fruit trees	218 6 6
Cost of freight	10 14 0
Cost of *pwet-nyet*, bees-wax, &c., for use in grafting	50 4 6
Cost of keg red lead, turpentine, raw oil, &c.	20 1 0
Cost of posts	4 0 0
Cost of *shaw*	3 8 0
Cost of coolie hire for weeding and clearing jungles	135 12 0
Cost of mats	2 13 0
Cost of bamboos	1 12 9
Cost of axle	8 0 0
Cost of coolie hire for conveyance of wire	0 1 0
Cost of thatch for thatching gardeners' houses	106 4 0
Miscellaneous	3 1 0
Herding Government bullocks	60 0 0
Total ...	2,134 5 9
Garden.	
(1) Establishment	167 0 0
(2) Cost of vegetable seeds	52 5 9
(3) Cost of *ngapi* for manuring asparagus	17 8 9
Total ...	236 14 6
Potatoes.	
(1) Conveyance (cart hire)	656 8 0
(2) Hoeing (coolie hire)	63 10 0
(3) Weeding (coolie hire)	2 12 0
(4) Conveyance of empty bags (cart hire)	0 12 0
(5) Digging (coolie hire)	30 0 0
Total ...	753 10 0
Wheat	0 4 0
Total expenditure up to the 31st March 1898 from the 1st June 1897.	
(*a*) Orchard	1,839 15 9
(*b*) Garden	208 14 6
(*c*) Potatoes	753 10 0
(*d*) Wheat	0 4 0
Total ...	2,802 12 3

STATEMENT B.—*Details of Disbursements from the 1st June 1897 to the 31st May 1898* —concluded.

Details.	Amount.		
Total expenditure from the 1st April 1898 to 31st May 1898.	Rs.	A.	P.
(*a*) Orchard	294	6	0
(*b*) Garden	28	0	0
Total ...	322	6	0
Grand Total from the 1st June 1897 to 31st May 1898.			
(*a*) Orchard	2,134	5	9
(*b*) Garden	236	14	6
(*c*) Potatoes	753	10	0
(*d*) Wheat	0	4	0
Total ...	3,125	2	3

List of Fruit-trees in Orchard, 1897.

Serial No.	Name.	From England.	From Saharanpur.	From Almora.	Buds and grafts. From grafts, 1895.	From grafts, 1896.	From grafts, 1897.	Total of each.	Total 1896.	Increase.	Decrease.	Stocks.	Stocks grafted and failed.
	APPLES.												
1	Worcester pearmain ...	14	...	...	...	...	7	21	14	7	...	...	...
2	Cashmere	...	...	...	...	...	...	...	1	...	1	...	...
3	Rymer	...	...	2	...	2	8	12	4	8	...	...	...
4	Cornish gilly-flower ...	...	...	3	...	1	8	12	4	8	...	...	...
5	Sturmer pippin ...	1	...	...	...	2	1	4	3	1	...	...	...
6	Duke of Devonshire ...	...	1	...	...	...	...	1	3		2	...	...
7	Bramley's seedling ...	15	...	...	...	11	...	26	28	...	2	...	...
8	Hawthornden	...	1	1	...	1	4	7	3	4	...	...	...
9	Cox's orange pippin ...	5	...	...	...	20	46	71	25	46	...	...	...
10	Stirling Castle	16	...	...	...	1	5	22	18	4	...	...	...
11	Blenheim orange ...	18	...	...	3	27	...	48	46	2	...	...	...
12	Dutch mignonne ...	...	1	...	...	...	6	7	1	6	...	...	...
13	Mannington's pearmain ...	2	...	...	...	1	6	9	3	6	...	...	...
14	New Northern greening ...	8	...	...	...	...	11	19	3	16	..	...	...
15	Devonshire quarrenden ...	4	...	...	...	2	5	11	6	5	...	...	...
16	Ecklinville seedling ...	14	...	...	1	9	23	47	24	23	...	...	...
17	Syke-house russet ...	...	...	1	...	...	...	1	1	...	...	...	...
18	Ribston pippin	9	...	...	...	1	8	18	13	5	...	...	...
19	King of pippin	6	2	1	...	1	9	19	10	9	...	...	...
20	Lane's Prince Albert ...	12	...	...	...	...	5	17	12	5	...	...	...
21	Dumelow's seedling ...	10	...	...	...	2	38	50	12	38	...	...	...
22	The Queen	13	...	...	1	10	10	34	24	10	...	...	...
23	Warner's King ...	13	..	...	1	7	13	34	21	13	...	...	...
24	Anne Elizabeth ...	6	...	...	...	...	13	19	8	11	...	...	...
25	Bess Pool	2	...	...	...	...	...	2	3	..	1	...	...
26	Golden white pearmain ...	3	...	...	1	8	19	31	12	19	...	...	...
27	Lord Grosvenor ...	10	...	...	...	...	2	12	11	1	...	...	...
28	Cox's pomona	6	...	...	...	7	4	17	13	4	...	...	...
29	Cockle pippin	...	...	2	...	...	2	4	2	2	...	...	...
30	Northern greening ...	...	7	...	...	8	10	25	15	10	...	...	...
31	Celine pippin	7	...	...	...	1	17	25	8	17	...	...	...
32	Wodhurst pippin ...	...	2		...	...	9	11	3	8	...	...	...
33	Early harvest	...	1	...	...	...	...	1	2	...	1	...	...
34	Newton pippin ...	...	2	...	...	...	4	6	2	4	...	...	...
35	Good seedfield ...	2	...	...	...	...	6	8	2	6	...	...	...
36	Fairy	...	3	...	...	...	3	6	3	3	...	...	...
	Carried over ...	196	20	10	7	122	302	657	363	294	...	...	...

List of Fruit-trees in Orchard, 1897—continued.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	Buds and grafts. From grafts, 1895.	From grafts, 1896.	From grafts, 1897.	Total of each.	Total 1896.	Increase.	Decrease.	Stocks.	Stocks grafted and failed.
	Brought forward ...	196	20	10	7	122	302	657	363	294	...	...	...
	Apples—*concluded.*												
37	Nonpareil ...	...	...	...	...	1	...	1	4	...	3	...	...
38	New Hawthornden ...	11	...	...	...	...	2	13	12	1	...	...	...
39	Golden Reineth ...	...	2	...	...	...	5	7	2	5	...	...	...
40	Golden Harvi ...	...	...	...	...	...	...	...	...	...	...	...	...
41	Kentish pippin ...	...	3	...	...	...	3	6	3	3	...	...	...
42	Melon pippin ...	...	...	1	...	...	3	4	...	4	...	...	...
43	Oslin pippin ...	...	3	...	...	...	1	4	3	1	...	...	...
44	Francis pippin ...	...	1	...	...	...	...	1	2	...	1	...	...
45	Almora, No. 1 ...	...	...	1	...	...	1	2	1	1	...	...	...
46	Almora, No. 3 ...	...	...	1	...	...	3	4	1	3	...	...	...
47	Peasgood Nonsuch ...	13	...	...	...	4	11	28	17	11	..	...	...
48	Yellow Fugestin ...	5	...	...	...	...	4	9	5	4	...	...	...
49	Tyler's Kevel ...	10	...	...	...	...	8	18	10	8	...	...	...
50	Lord Suffield ...	10	...	..	...	...	14	24	10	14	...	...	...
51	Gascoigne's seedling ...	4	...	...	...	...	5	9	4	5	...	...	...
52	Grenadier ...	5	...	...	...	...	4	9	5	4	...	...	...
53	Gold medal ...	9	...	...	...	...	...	9	9	...	...	...	...
54	Duchess of Oldenburg ...	10	...	...	...	...	...	10	10	...	.	..	...
55	Chelmsford Wonder ...	5	...	...	...	...	...	5	5	...	...	...	...
56	Lady Sudely ...	4	...	...	...	...	1	5	4	1	...	...	...
57	Frogmore prolific ...	5	...	...	...	...	...	5	5	...	...	...	...
58	Potts seedling ...	5	...	...	...	...	1	6	5	1	...	...	...
59	Golden spire ...	5	...	...	...	...	2	7	5	2	...	...	...
60	Beauty of Bath ...	5	...	...	...	...	4	9	5	4	...	...	...
61	Tower of Glaims ...	4	...	...	...	...	3	7	4	3	...	...	...
62	Bismarck ...	3	...	...	...	...	...	3	3	...	...	...	...
63	Irish peach ...	9	...	...	...	...	2	11	9	2	...	...	...
64	Mr. Gladstone ...	5	...	...	...	...	4	9	5	4	...	...	...
65	Sandringham ...	4	...	...	...	...	3	7	4	3	...	...	...
66	Without label ...	...	...	...	...	...	...	11	16	...	5	...	...
67	Apple stock ...	...	...	...	...	..	...	...	...	...	...	811	...
	Total ...	327	29	13	7	127	386	900	531	369	...	811	166
	Pears.												
1	Marie Louise ...	7	2	...	12	8	20	49	29	20	...	...	...
2	Victoria ...	...	2	...	9	2	8	21	13	8	...	...	...
3	Louise Bonne de Jersey ...	14	1	...	6	4	7	32	27	5	...	...	...
4	Doyenne du Comice ...	13	...	...	...	1	10	24	14	10	...	...	..
5	Glout Morceau ...	10	...	...	1	...	...	11	11	...	...	...	...
6	Jargonelle ...	15	2	...	18	8	69	112	43	69	...	...	...
7	Thomsons ...	...	...	...	1	...	...	1	1	...	...	...	...
8	Beurre superfine ...	4	...	...	2	...	11	17	7	10	...	...	...
9	Flemish Beauty ...	...	2	1	14	2	6	25	19	6	...	...	...
10	Pitmaston Duchess ...	10	...	...	2	.	11	23	17	6	...	...	...
11	Easter Beurre ...	14	..	...	10	1	30	55	25	30	...	...	...
12	Huyshe's Bergamotte ...	...	2	...	9	9	4	24	20	4	..	...	...
13	Bergamotte D'Esperen ...	7	...	...	2	1	6	16	10	6	...	...	...
14	Williams' Bon Chretien ...	12	...	...	...	...	23	35	12	23	...	...	...
15	Winter Nelis ...	7	...	...	3	7	6	23	19	4	...	...	...
16	Catillæ ...	6	...	...	1	2	2	11	10	1	...	...	...
17	China ...	...	1	...	...	...	...	1	1	...	...	...	...
18	La Counte ...	...	30	...	...	15	53	98	45	53	...	...	...
19	Kriffer ...	...	30	...	...	...	70	100	30	70	..	...	...
20	Conseiller de la Cour ...	7	...	...	...	..	8	15	7	8	...	...	...
21	General Todleben ..	7	...	...	...	3	21	31	10	21	...	...	...
22	Beurre Diel ...	7	...	...	...	3	19	29	10	19		...	...
23	Rivers Fertility ..	7	...	..	...	...	3	10	7	3	...	...	...
24	Beurre Hardy ...	11	...	...	...	...	15	26	12	14	..	...	...
25	Beurre D'Amaulis ...	12	...	...	...	3	12	27	15	12	...	...	...
26	Doyenne du Boussoch ...	6	...	...	...	...	9	15	6	9	...	...	...
27	Uvedale St. Germain ...	4	...	..	...	...	6	10	5	5	...	...	...
28	Fondante D'Autumn ...	5	...	...	...	...	7	12	5	7	...	...	...
29	Beurre Ravee ...	11	...	...	...	...	1	12	11	1	...	...	...
30	Duchess D'Angouleme ...	5	...	...	...	...	6	11	5	6	...	...	...
	Carried over ...	201	72	1	90	69	443	876	446	430	...	...	...

List of Fuit-trees in Orchard, 1897—concluded.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	Buds and grafts: From grafts, 1895.	Buds and grafts: From grafts, 1896.	Buds and grafts: From grafts, 1897.	Total of each.	Total 1896.	Increase.	Decrease.	Stocks.	Stocks grafted and failed.
	Brought forward ...	201	72	1	90	69	443	876	446	430	...	...	...
	PEARS—*concluded.*												
31	Beurre D'Aremburg ...	5	...	...	...	...	1	6	5	1	...	...	...
32	Hassell ...	4	...	...	...	...	17	21	5	16	...	...	...
33	Brockworth Park ...	4	...	...	...	...	4	8	5	3	...	...	...
34	Doyenne D'Ete ...	2	...	...	...	...	...	2	5	...	3	...	...
35	Magnate ...	5	...	...	...	...	4	9	5	4	...	...	...
36	Clapp's favourite ...	11	...	...	...	...	8	19	11	8	...	...	...
37	Souverine de Congress ...	5	...	...	...	...	1	6	5	1	...	...	...
38	Gratisle of Jersey ...	3	...	...	...	1	11	15	6	9	...	...	...
39	Preyre ...	4	...	...	...	...	13	17	4	13	...	...	...
40	Beurre D'Assumption ...	10	...	...	...	...	...	10	10	...	...	...	...
41	Comte D'Lamy ...	5	...	...	...	3	1	9	8	1	...	...	...
42	Beurre Bachelier ...	5	...	...	...	...	22	27	5	22	...	...	...
43	Beurre de Clairgeau ...	3	...	...	...	...	...	3	5	...	2	...	...
44	Baronne D'Mello ...	4	...	...	...	...	10	14	5	9	...	...	...
45	Passe Colmar ...	3	...	...	...	...	...	3	4	...	1	...	...
46	Beurre Capianmont ...	4	...	...	...	...	5	9	4	5	...	...	...
47	Durandeau ...	3	...	...	...	...	...	3	5	...	2	...	...
48	Josephine D'Malines ...	4	...	...	...	...	2	6	4	2	...	...	...
–	Pear stocks ...	...	...	...	...	...	...	...	...	...	...	166	...
	Without label ...	...	...	...	...	...	...	9	10	...	1	...	...
	Total ...	285	72	1	90	73	542	1,072	557	515	...	166	15
	PLUMS.												
1	Kabul greengage ...	...	1	...	...	...	...	1	1	...	...	...	...
2	Guthrie's late greengage ...	...	2	...	3	6	...	11	18	...	7	...	...
3	Prince Englebert ...	6	...	...	...	5	1	12	12	...	...	...	...
4	Rune Claude de Violette ...	...	2	...	...	...	...	2	2	...	...	...	...
5	Jefferson ...	7	2	...	...	2	...	11	12	...	1	...	...
6	Washington ...	...	1	...	...	...	...	1	1	...	...	...	...
7	Victoria ...	5	...	...	2	5	...	12	13	...	1	...	...
8	Early prolific ...	6	3	...	13	7	6	35	29	6	...	...	...
9	Alucha, black ...	...	1	...	...	...	...	1	1	...	...	...	...
10	Chettenden damson ...	1	...	...	...	...	...	1	1	...	...	...	...
11	Black diamond ...	6	...	...	2	...	...	8	12	...	4	...	...
12	Cox's golden drop ...	4	3	...	1	6	3	17	16	1	...	...	...
13	Early dwarf, yellow ...	...	2	...	...	...	...	2	1	1	...	...	...
14	Greengage ...	6	...	...	1	...	...	7	12	...	5	...	...
15	Bruhy's greengage ...	...	...	2	2	...	...	4	4	...	...	...	...
16	Smith's purple prolific ...	2	...	...	...	...	...	2	3	...	1	...	...
17	Alucha, red ...	...	1	...	...	...	...	1	1	...	...	...	...
18	Denniston's superb ...	5	...	...	...	...	...	5	12	...	7	...	...
19	Goldengage ...	...	2	...	3	6	2	13	11	2	...	...	...
20	Alubukhara, large ...	...	1	...	...	...	...	1	2	...	1	...	...
21	Asperic ...	...	1	...	...	...	...	1	1	...	...	...	...
22	Prune ...	...	1	...	2	5	7	15	8	7	...	...	...
23	Alubukhara, small ...	...	1	...	...	...	...	1	1	...	...	...	...
24	From tree No. 2, row No. 1	...	...	...	...	4	...	4	6	...	2	...	...
	Plum stocks ...	...	...	...	...	...	...	...	...	...	...	64	...
	Without label ...	...	...	...	...	...	...	8	9	...	1	...	...
	Total ...	48	24	2	29	46	19	176	189	...	13	64	...
	PEACHES.												
1	Early River ...	...	...	8	2	8	...	18	27	...	9	...	...
2	Large Agra ...	...	2	...	...	5	...	7	7	...	...	...	...
3	Hardoi ...	...	1	...	...	...	...	1	1	...	...	...	...
4	Violette Hative ...	3	...	...	...	...	1	4	3	1	...	...	...
5	Country No. 2 ...	...	2	...	...	1	...	3	4	...	1	...	...
6	Rhenny Shipstone ...	...	...	1	1	1	...	3	5	...	2	...	...
7	Dr. Hogg ...	...	...	2	...	3	...	5	5	...	...	...	...
8	Honey ...	...	...	2	...	4	...	6	6	...	...	...	...
	Carried over ..	3	5	13	3	22	1	47	58	...	11	...	...

List of Fruit-trees in Orchard, 1897—continued.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	Buds and grafts. From grafts, 1895.	From grafts, 1896.	From grafts, 1897.	Total of each.	Total 1896.	Increase.	Decrease.	Stocks.
	Brought forward ...	3	5	13	3	22	1	47	58	...	11	...
	Peaches—*concluded.*											
9	China, flat	...	1	...	...	...	...	1	1	...	...	...
10	Grosse Mignonne	3	...	...	...	...	...	3	4	...	1	...
11	Stirling Castle	...	...	2	1	...	...	3	3	...	...	...
12	Anderson's Spring Hill ...	...	...	1	...	1	...	2	2	...	...	...
13	Early York	...	...	1	...	...	...	1	1	...	...	...
14	Prince of Wales	2	...	...	...	...	...	2	4	...	2	...
15	Belle Garde	2	...	...	...	...	...	2	2	...	...	...
16	Alexander Noblesse	3	...	...	1	...	...	4	4	...	...	...
17	Royal George	3	...	...	1	...	...	4	8	...	4	...
18	Peach, Madras	...	2	...	7	10	2	21	19	2	...	...
19	Crimson Galande	2	...	...	3	3	...	8	10	...	2	...
20	Country No. 1	...	2	...	...	...	1	3	3	...	...	...
21	Hakin	...	1	...	...	4	...	5	6	...	1	...
22	Country No. 3	...	1	...	...	2	...	3	3	...	...	...
23	Country No. 4	...	3	...	...	7	...	10	12	...	2	...
	Peach stocks	...	...	...	...	...	...	...	...	...	...	17
	Without label	...	...	...	...	...	...	11	3	8	...	...
	Total ...	18	15	17	16	49	4	130	143	...	13	17
	Apricots.											
1	Hemskirke	4	3	...	...	...	...	7	6	1	...	...
2	Moore Park	5	3	4	1	3	...	16	16	...	...	...
3	Large early	3	...	...	...	...	1	4	3	1	...	...
4	Cashmere	...	2	...	...	2	...	4	5	...	1	...
5	New large early	...	...	2	...	...	...	2	3	...	1	...
6	Royal	...	...	3	1	2	1	7	6	1	...	...
7	Brussels	...	...	2	1	...	...	3	4	...	1	...
8	Early orange	...	...	2	1	3	...	6	7	...	1	...
9	Frogmore	...	...	1	...	...	...	1	2	...	1	...
10	Golden drops	...	2	...	...	...	...	2	2	...	...	...
11	Mexican	...	2	...	...	...	...	2	2	...	...	...
12	Without label	...	...	...	...	...	...	11	11	...	...	...
	Total ...	12	12	14	4	10	2	65	67	...	2	...
	Nectarines.											
1	Claremont	...	2	...	...	22	...	24	33	...	9	...
2	Kabul	...	2	...	...	2	...	4	12	...	8	...
3	Murray	...	2	...	2	3	...	7	7	...	...	...
4	Peach	...	...	1	...	2	...	3	6	...	3	...
5	Elruge	2	...	...	...	...	...	2	3	...	1	...
6	Lord Napier	2	...	...	...	...	...	2	2	...	...	...
7	Pitmaston orange	3	...	...	5	1	...	9	9	...	...	...
8	New white	...	3	...	...	29	...	32	43	...	11	...
9	Hardwick's early	5	...	...	3	...	...	8	8	...	...	...
10	Without label	...	...	...	...	...	...	2	2	...	...	...
	Total ...	12	9	1	10	59	...	93	125	...	32	...
	Cherries.											
1	May Duke	6	...	...	...	1	12	19	7	12	...	...
2	Begareau Napoleon ...	6	...	...	...	1	2	9	7	2	...	...
3	Warder's early black ...	8	...	...	...	2	6	16	10	6	...	...
4	Begareau	5	...	...	...	...	5	10	5	5	...	...
5	Kentish	6	...	...	...	4	15	25	10	15	...	...
6	Knight's early black ...	6	...	...	...	...	...	6	6	...	...	...
7	Florence	5	...	...	...	...	2	7	5	2	...	...
8	Morello	3	...	...	...	...	11	14	3	11	...	...
	Carried over ...	45	...	...	...	8	53	106	53	53	...	...

List of Fruit-trees in Orchard, 1897—concluded.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	Buds and grafts. From grafts, 1895.	From grafts, 1896.	From grafts, 1897.	Total of each.	Total 1896.	Increase.	Decrease.	Stocks.
	Brought forward ...	45	...	...	...	8	53	106	53	53	...	...
	CHERRIES—*concluded.*											
9	Elton	3	...	...	...	...	2	5	3	2	...	...
10	Almora No. 207 ...	...	...	2	...	...	3	5	2	3	...	...
11	Without label	...	...	...	...	...	...	1	1	...	...	...
...	Cherry stocks	...	...	...	...	...	...	...	...	...	...	2
	Total ...	48	...	2	...	8	58	117	59	58	...	2
	QUINCE	...	...	...	...	...	...	5	5	...	...	...
	MULBERRY	...	...	...	...	...	...	1	1	...	...	...
	VACANCIES	...	...	...	...	...	...	132	177	...	45	...

List of Fruit-trees in Orchard, 1897.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From cuttings.	Total of each.	Total 1896.	Increase.	Decrease.
	VINES.								
1	Black Hamburg	6	...	...	...	6	6	...	...
2	Miss Pearson	...	...	1	...	1	1	...	...
3	Gross Colmar	...	...	2	...	2	2	...	...
4	Muscat Alexendri	1	...	...	...	1	1	...	...
5	Trentham black	...	...	2	...	2	2	...	...
6	West St. Peter	...	...	2	...	2	2	...	...
	Total ...	7	...	7	...	14	14	...	...
	FIGS.								
1	Brown Turkey	5	...	...	14	19	22	...	3
2	Large Negro	2	...	...	4	6	3	3	...
	Total ...	7	...	...	18	25	25	3	3
	CURRANTS.								
1	Red Dutch	5	...	...	3	8	21	...	13
2	Raby Castle	1	...	...	...	1	1	...	...
3	Black Naples	...	...	...	1	1	3	...	2
	Total ...	6	...	...	4	10	25	...	15
	GOOSEBERRIES.								
1	White Smith	1	...	...	...	1	1	...	...
2	Crown Bob	...	...	...	...	...	1	...	1
	Total ...	1	...	...	...	1	2	...	1
	NUTS.								
1	Walnuts	...	...	...	...	21	23	...	2
2	Hazelnuts	...	...	...	...	...	7	...	7
3	Cobnuts	...	...	...	...	1	5	...	4
4	Filberts	...	...	...	...	6	6	...	...
	Total ...	...	...	...	...	28	41	...	13

APPENDIX B.

STATEMENT No. III.—*Distribution list of seed obtained for experimental cultivation during the year 1897-98.*

Number.	How distributed. District.	How distributed. Designation or name of officer receiving seed.	Ground-nut. Quantity.	Ground-nut. Date.	Tobacco. Quantity.	Tobacco. Date.	English vegetable seeds. Quantity.	English vegetable seeds. Date.	Carrot seed. Quantity.	Carrot seed. Date.	Castor-oil seed. Quantity.	Castor-oil seed. Date.
1	2	3	4	5	6	7	8	9	10	11	12	13
	LOWER BURMA.		Bkts.		lbs.		lbs.		lbs.		lbs.	
1	Akyab ...	Superintendent of Jail ...	...	.....	...	.....	...	.....	6	8th Oct. 1897	...	.....
2	Rangoon ...	Ditto ...	...	.....	...	.....	...	.....	30	8th Oct. 1897	...	.....
3	Rangoon, Insein	Ditto ...	...	.....	...	.....	...	.....	24	8th Oct. 1897	...	.....
4	Hanthawaddy	Deputy Commissioner ...	...	.....	1	17th July 1897	...	.....	...	.....	...	.....
5	Tharrawaddy...	Ditto ...	...	.....	1	17th July 1897	...	.....	...	.....	...	.....
6	Prome ...	Superintendent of Jail ...	...	.....	...	.....	...	.....	12	8th Oct. 1897	...	.....
7	Prome, Paungdè	Ditto ...	...	.....	...	.....	...	.....	3	8th Oct. 1897	...	.....
8	Bassein ...	Deputy Commissioner ...	...	.....	1	17th July 1897	...	.....	...	.....	...	.....
9	Bassein ...	Superintendent of Jail ...	...	.....	...	.....	...	.....	9	8th Oct. 1897	...	.....
10	Myaungmya ...	Deputy Commissioner ...	...	.....	1	17th July 1897	...	.....	...	.....	...	.....
11	Thôngwa ...	Superintendent of Jail ...	...	.....	...	.....	...	.....	6	8th Oct. 1897	...	.....
12	Henzada ...	Ditto ...	...	.....	...	.....	...	.....	4	8th Oct. 1897	...	.....
13	Toungoo ...	Ditto ...	...	.....	...	.....	...	.....	4	8th Oct. 1897	...	.....
14	Salween ...	Deputy Commissioner ...	...	.....	1	17th July 1897	...	.....	...	.....	...	.....
15	Thatôn ...	Ditto ...	...	.....	1	17th July 1897	...	.....	...	.....	...	.....
16	Thatôn, Shwegyin.	Superintendent of Jail ...	...	.....	...	.....	...	.....	5	8th Oct. 1897	...	.....
17	Amherst ...	Deputy Commissioner ...	...	.....	1	17th July 1897	...	.....	...	.....	...	.....
18	Amherst, Moulmein.	Superintendent of Jail ...	...	.....	...	.....	...	.....	5	8th Oct. 1897	...	.....
19	Amherst, Moulmein.	Secretary, Agri-Horticultural, Society.	...	.....	1	17th July 1897	...	.....	5	8th Oct. 1897	...	.....
20	Tavoy ...	Deputy Commissioner ...	...	.....	½	17th July 1897	...	.....	...	.....	...	.....
21	Tavoy ...	Superintendent of Jail ...	...	.....	...	.....	...	.....	6	8th Oct. 1897	...	.....
22	Mergui ...	Ditto ...	...	.....	...	.....	...	.....	...	8th Oct. 1897	...	.....
23	Mergui ...	Deputy Commissioner ...	...	.....	1	17th July 1897	...	.....	...	.....	...	.....
		Carried over ...	...	.....	9½	.....	...	.....	119	.....	...	.....

STATEMENT No. III.—*Distribution list of seed obtained for experimental cultivation during the year 1897-98*—concluded.

Number.	How distributed. District.	How distributed. Designation or name of officer receiving seed.	Ground-nut. Quantity.	Ground-nut. Date.	Tobacco. Quantity.	Tobacco. Date.	English vegetable seeds. Quantity.	English vegetable seeds. Date.	Carrot seed. Quantity.	Carrot seed. Date.	Castor-oil seed. Quantity.	Castor-oil seed. Date.
1	2	3	4	5	6	7	8	9	10	11	12	13
			Bkts.		lbs.		lbs.		lbs.		lbs.	
		Brought forward ...	...	.....	9½	.....	...	.....	119	.....	...	.....
	UPPER BURMA.											
24	Thayetmyo ...	Deputy Commissioner ...	3	26th April 1897	½	17th July 1897	...	.....	...	.....	...	.....
25	Pakôkku ...	Ditto ...	3	26th April 1897	2	17th July 1897	4	16th Sept. 1897	...	.....	...	.....
26	Minbu ...	Ditto ...	3	26th April 1897	1	17th July 1897	...	.....	...	.....	...	.....
27	Magwe ...	Ditto ...	6	26th April 1897	1	17th July 1897	...	.....	1½	8th Oct. 1897	...	.....
28	Mandalay ...	Ditto ...	3	26th April 1897	3	17th July 1897	4	16th Sept. 1897	...	.....	...	.....
29	Mandalay ...	Superintendent of Jail ...	...	.....	...	.....	...	.....	12	8th Oct. 1897	...	.....
30	Bhamo ...	Ditto ...	...	.....	...	.....	...	.....	6	8th Oct. 1897	...	.....
31	Bhamo ...	Deputy Commissioner ...	3	26th April 1897	...	.....	4	16th Sept. 1897	...	.....	...	.....
32	Myitkyina ...	Ditto ...	3	26th April 1897	½	17th July 1897	12	16th Sept. 1897	...	.....	...	.....
33	Katha ...	Ditto ...	9	26th April 1897	...	.....	8	16th Sept. 1897	...	.....	...	.....
34	Katha ...	Superintendent of Jail ...	...	.....	...	.....	...	.....	6	8th Oct. 1897	...	.....
35	Ruby Mines ...	Deputy Commissioner ...	6	26th April 1897	...	.....	4	16th Sept. 1897	...	.....	...	.....
36	Shwebo ...	Ditto ...	12	26th April 1897	1	17th July 1897	4	16th Sept. 1897	...	.....	...	.....
37	Shwebo ...	Superintendent of Jail ...	...	.....	...	.....	...	.....	6	8th Oct. 1897	...	.....
38	Sagaing ...	Deputy Commissioner ...	18	26th April 1897	2	17th July 1897	4	16th Sept. 1897	...	.....	...	.....
39	Lower Chindwin	Ditto ...	3	26th April 1897	1	17th July 1897	4	16th Sept. 1897	...	.....	...	.....
40	Lower Chindwin	Superintendent of Jail ...	...	.....	...	.....	...	.....	1½	8th Oct. 1897	...	.....
41	Upper Chindwin	Deputy Commissioner ...	21	26th April 1897	1	17th July 1897	8	16th Sept. 1897	...	.....	...	.....
42	Meiktila ...	Commissioner ...	...	.....	...	.....	...	.....	60	8th Oct. 1897	...	.....
43	Meiktila ...	Deputy Commissioner ...	6	26th April 1897	1	17th July 1897	...	.....	...	.....	...	.....
44	Meiktila ...	Superintendent of Jail ...	...	.....	...	.....	...	.....	6	8th Oct. 1897	...	.....
45	Yamèthin ...	Ditto ...	...	.....	...	.....	...	.....	4	8th Oct. 1897	...	.....
46	Yamèthin ...	Deputy Commissioner ...	3	26th April 1897	...	.....	...	.....	...	.....	...	.....
47	Myingyan ...	Ditto ...	12	26th April 1897	½	17th July 1897	4	16th Sept. 1897	...	.....	...	.....
48	Myingyan ...	Superintendent of Jail ...	...	.....	...	.....	...	.....	4	8th Oct. 1897 ...	...	.....
49	Myingyan ...	Superintendent of Jail, through Inspector-General of Jails, Burma.	...	.....	...	.....	...	.....	...	.....	32	4th Nov. 1897.
50	Chin Hills, Falam	Political Officer ...	...	.....	...	.....	8	16th Sept. 1897	..	.....	...	.....
		Total ...	114	.....	24	.....	68	.....	226	.....	32	.....

STATEMENT No. IV.—*Description of seeds received, together with the cost of consignment and of distribution during the year 1897-98.*

Seeds.		From	Date of receipt.	Cost of consignment.	Cost of distribution.
Description.	Quantity.				
				Rs. A. P.	Rs. A. P.
Ground-nuts	114 baskets.	British Consul, Pondicherry ...	19th April 1897	200 0 0	40 4 6
Havana and Virginia tobacco.	24 lbs. ...	D. Landreth and Sons, Philadelphia, United States of America.	28th June 1897	310 9 7	10 4 0
English vegetable seeds.	68 lbs. ...	England, Sutton and Sons ...	21st July 1897	430 1 0	...
Carrots, red, white, and yellow variety.	226 lbs. ...	Director of Land Records, North-Western Provinces and Oudh, Cawnpore.	4th Oct. 1897	50 12 0	23 7 6
Castor-oil seed.	32 lbs. ...	Secretary, Agri-Horticultural Society, Burma.	29th Oct. 1897	24 0 0	...
		Total ...	...	1,015 6 7	74 0 0

STATEMENT No. V.—*Experimental cultivation—Ground-nut.*

No.	District.	Particulars regarding experiment.	Result of experiment.
			UPPER BURMA.
1	Thayetmyo...	Distributed to the Subdivisional Officers, Myedè and Minhla.	The experiments, which failed, were attributed by the Subdivisional Officer, Myedè, to bad soil.
2	Pakôkku ...	Distributed to the Township Officer, Yesagyo.	The experiments were made at Sincheya, Sin-ma-ye, Milaung-kyun, Kyunbyat, Kabyu, and Kunzibin villages. With the exception of the two villages of Kabyu and Kunzibin, in which they failed for want of interest on the part of the experimentalists, the experiments in the other villages proved successful. Samples of ground-nuts were sent for inspection.
3	Minbu ...	Distributed to the Subdivisional Officers, Minbu and Salin.	In Minbu subdivision the experiments were tried in six villages. In Kalahaung village the seeds germinated, but the plants were rooted up by bears and deer; in other villages the experiment failed entirely for want of care. In Salin subdivision the experiments were made in six villages; in three villages the crops failed entirely for want of water; in other villages, *i.e.*, Kunkyin, Magyigan, and Kyawun, the plants that succeeded in surviving the drought were, to a great extent, destroyed by insects. Samples of ground-nuts were forwarded for inspection.
4	Magwe ...	Distributed to the Subdivisional Officer, Taungdwingyi, Township Officers, Natmauk and Magwe, and the Superintendent of Jail.	The Subdivisional Officer, Taungdwingyi, distributed the ground-nuts to the Township Officers, Taungdwingyi, Myothit, and Myingun. Some of the seeds sown by the Township Officer, Taungdwingyi, germinated and bore a crop weighing 10 lbs., some did not even germinate, as the rainfall was not in time. In Myothit some of the plants germinated, but withered away on account of the overflowing of the Yinchaung, and in Myingun the plants were destroyed by white-ants. Those grown in Natmauk and Magwe townships resulted in failure. The Superintendent, Magwe Jail, reports that the experiment was tried in the Jail garden. The plants germinated and bore a crop of 218 lbs., which were sold for Rs. 17-5-9 at Rs. 28 per 100 viss.
5	Mandalay ...	Distributed to thugyis	The experiment failed, owing to the supineness of the thugyis to whom the ground-nuts were sent for trial.
6	Bhamo ...	Distributed to thugyis and villagers.	Failed entirely as the ground-nuts were sown in a careless manner, and no care was bestowed on them by the thugyis and villagers, who have no ambition to acquire a knowledge of growing articles other than paddy.

STATEMENT No. V.—*Experimental cultivation—Ground-nuts*—concluded.

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA—concluded.	
7	Myitkyina ...	.....	Station-master, Katha, reports that the bag of ground-nuts sent to Myitkyina for experimental cultivation was burnt when the Katha station was destroyed by fire on the 10th May 1897.
8	Katha ...	Distributed to *Myothugyi* of Nagasin circle, Kawlin township.	Failure; seed did not germinate; said to have been old and rotten.
9	Ruby Mines	Distributed to Subdivisional Officers.	Failed, except at Mogôk, where experiment was a partial success.
10	Shwebo ...	.....	Succeeded in Tèbin and Nyaunggaung villages, but failed in other places. Failure was due to want of rain.
11	Sagaing ...	Distributed to Subdivisional Officers.	In the Amyin circle of the Myinmu subdivision the experiment was successful. In other cases the crop was a failure The failure was attributed chiefly to want of rain.
12	Lower Chindwin.	Distributed to five Township Officers.	Failed in Budalin township, as the crop was destroyed by insects. In Mônywa township the experiment was fairly successful in one place, and the outturn was 45 lbs. In Mintaingbin township the experiment was not very successful for want of rain. In Salingyi township the experiment was successful, the outturn being 102·20 lbs. per acre. Township Officer reports that the soil in this township is favourable for ground-nut cultivation. In Kani township the experiment failed, owing to excess of rain.
13	Upper Chindwin.	.....	Failed, with the exception of a few seeds, which germinated in the Kindat and Legayaing subdivisions. The failure is attributed generally to unsuitable soil, excessive rain, and bad seed.
14	Meiktila ...	.....	Failed for want of water.
15	Yamèthin ...	Distributed to Subdivisional Officers.	In most cases the experiment failed, owing to insufficient rainfall during the season.
16	Myingyan ...	Distributed to Subdivisional Officers, Myingyan and Pagan.	None of the experiments proved a success, except in the Salè township of the Pagan subdivision, where one basket of ground-nuts was sown and three baskets cropped. The failure is ascribed to the scarcity of rain.

STATEMENT No. VI.—*Experimental cultivation—Tobacco.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		LOWER BURMA.	
1	Hanthawaddy	Distributed to Subdivisional and Township Officers.	The experiment proved a failure in every case.
2	Tharrawaddy	Distributed to seven thugyis.	In four cases from Tapun township and one from Mônyo, the seeds did not germinate and in others the plants grew up unhealthy.
3	Bassein ...	Distributed to cultivators.	Most of the experiments failed for want of dew; some plants thrived and are saleable, but not in quantities sufficient for sale to the public.
4	Myaungmya	Grown on *kaing* land. Planted in October.	Failed. The plants died off when still young.
5	Salween.		
6	Thatôn ...	.....	The experiment proved more or less a failure. In Maingmahlagyun the plants grew up to some size, but the dried leaves crumbled up like dry plantain leaves and when rolled into cigars had a rather bitter flavour.
7	Amherst ...	.....	Deputy Commissioner reports that the seeds were made over to Township Officer, Haungtharaw, for experimental cultivation, but the Township Officer has taken no further trouble over the matter.

STATEMENT No. VI.—*Experimental cultivation—Tobacco*—concluded.

No.	District.	Particulars regarding experiment.	Result of experiment.
		LOWER BURMA—concluded.	
8	Amherst (Moulmein).	Secretary, Agri-Horticultural Society.	The seed was tested before distribution, and germinated freely, and should give good results wherever the cultivation was tried.
9	Tavoy ...	Distributed to thugyis and headmen through Township Officers.	The experiment was partially successful in two out of the four townships. The leaves were smaller than the native tobacco, but the flavour and colour are said to be superior to that of the indigenous kind. Samples of the leaves were sent for inspection.
10	Mergui ...	Distributed to the Subdivisional Officer, Maliwun, and the Township Officers, Palaw and Tenasserim.	The Subdivisional Officer, Maliwun, and the Township Officer, Palaw, report that the seeds germinated and the plants were doing well. The Subdivisional Officer, Maliwun, was satisfied with the result. Samples of the leaves cured were forwarded for inspection. The experiment has not proved successful in the Tenasserim township.
		UPPER BURMA.	
11	Thayetmyo ...	Distributed to the Subdivisional Officers, Myedè and Thayetmyo.	In Myedè the experiment was partially successful, but in Mindôn it was a complete failure, owing to heavy rains.
12	Pakôkku ...	Distributed to Myoôks of Seikpyu, Pakôkku, and Yesagyo.	In Seikpyu the experiment was a failure for want of rain. The native tobacco also failed from the same cause. In Pakôkku the plants were destroyed by flood. In Yesagyo the experiment proved successful. Samples of leaves were sent for inspection.
13	Minbu ...	Distributed to Subdivisional Officers and the Superintendent of Jail.	The experiments proved a failure in every case.
14	Magwe ...	Distributed to Subdivisional Officers and Township Officers	The experiment failed in Magwe on account of flood; but in Yenangyaung and Taungdwingyi it proved successful and produced about 115 viss and 16½ lbs. of tobacco respectively. Samples of leaves were sent for inspection.
15	Mandalay ..	.....	Experiment entirely failed. No reason for this is given.
16	Myitkyina ...	Grown on alluvial land; not manured or irrigated. Planted in October.	The experiment was on the whole a success. Half a pound of seed sown yielded 300 viss of tobacco. The largest leaves measure 1½ spans broad and 3 spans long. In Wègyi circle some plants were damaged by insects.
17	Shwebo ...	.....	The experimental cultivation of tobacco was successful only in two villages in the Ye-u subdivision. That tried elsewhere proved a failure. The cause of failure is ascribed in some cases to want of rain, while in others to too much of it.
18	Sagaing ...	Distributed to Subdivisional Officers.	The experiment was successful in Pauktaw and Udi in the Ava township, but failed in Myinnu and Myotha subdivisions.
19	Lower Chindwin.	.....	The experiments were made in four townships— *Budalin township.*—In one place the plants died on account of excess rain and in the other the seeds were destroyed by ants. *Mônywa township.*—Failed owing to untimely rainfall. *Kani township.*—The plants did not turn out so well as the Burmese tobacco. *Salingyi township.*—The experiment was fairly successful.
20	Uppe Chindwin.r	.....	The experiment was not successful as the plants were destroyed by vermin.
21	Meiktila ...	Distributed to Thugyis of Kadugan, Shwesitsin and Chaukpan circles.	The experiment proved a failure in every case, owing to the poorness of the soil and want of rain.
22	Myingyan ...	Distributed to Thugyis of Anein and Ngabinzin.	Both the experiments failed. The failures are attributed to the unexpected rise of river in Anein and for want of rain in Ngabinzin.

STATEMENT No. VII.—*Experimental cultivation—English vegetable seeds.*

No.	District.	Particulars regarding experiment.	Result of experiment.
			UPPER BURMA.
1	Pakôkku ...	Distributed to the Subdivisional Officers, Pauk and Gangaw, Township Officer, Yesagyo, and the Superintendent of Jail, Pakôkku.	Most of the experiments proved successful in Pauk, Yesagyo and Pakôkku, but not in Gangaw on account of insufficient water. Asparagus and broccoli do not appear to grow well in these parts.
2	Mandalay ...	Distributed to thugyis	Radish, cabbage, lettuce, knol-kohl, mustard, beet, beans, cauliflower, and carrot did remarkably well, and the out-turn was abundant and satisfactory. Other seeds failed, as some were destroyed by insects, while the rest were washed away by the rain.
3	Bhamo ...	.....	Lettuce, beet, carrot, and pea turned out well. Although other seeds grew up well, they were destroyed by red-ants.
4	Myitkyina ...	.....	In Myitkyina the plants did not come out well as the seeds were received too late and the result was a failure. In Sadôn the experimental cultivation has proved successful, except broccoli and asparagus. In Mogaung beans, green-peas, tomatoes and cellery proved partially successful. The remaining crops failed, owing to heavy destruction by insects.
5	Katha ...	Distributed to Subdivisional Officers and the Battalion Commandant, Katha.	In Katha the experiment was not very successful, owing to insects. In Wuntho all varieties were successful except carrot, cabbage, cauliflower, and broccoli. In Banmauk the results were good, with the exception of broccoli and lettuce. Experiment tried by the Battalion Commandant, Katha, was successful, except as regards asparagus and broccoli, which did not turn out well.
6	Ruby Mines	.....	The experiment proved a great success.
7	Shwebo ...	Grown by the Subdivisional Officers, Shwebo, Ye-u and Tantabin, and the Superintendent of Jail, Shwebo.	In Shwebo and Ye-u the experiment was a success, except that in the former beans and in the latter asparagus, broccoli, cauliflower and celery proved a failure. In Tantabin the experiment was a failure. In the jail garden cauliflower and cabbage gave excellent results.
8	Sagaing ...	Planted by the Civil Surgeon, Settlement Officer, Township Officer, Chief Clerk, and Advocate, Sagaing.	The Civil Surgeon, Settlement Officer, Township Officer and Advocate report that owing to heavy rain the experiment was only partially successful. The experiment made by the Chief Clerk of the Deputy Commissioner's office proved a success, as the water was drained off and the cultivation thus saved.
9	Lower Chindwin.	Distributed to Subdivisional Officers and Township Officers.	In Budalin subdivision the experiment has been fairly successful, as the Myoôk took some interest in the cultivation. In Pale the experiment failed as the Subdivisional Officer and Township Officer took no interest in the experiment.
10	Upper Chindwin.	.....	The result of the experiment was favourable except in Maingkaing township. The following seeds did well: cabbages, peas, tomatoes, lettuce, radishes, knol-kohl, and carrots.
11	Myingyan ...	.....	The Superintendent of Jail reports that cauliflower, carrot, cabbage, radish, knol-kohl, beet, tomato, broccoli, and lettuce were grown successfully, but the other seeds proved a failure, as the Jail garden soil is not adapted for their cultivation.
12	Chin Hills (Falam).	.....	The experiment proved a success as the climate was suitable. The Superintendent reports that the cultivation of grass seed would be very useful for the supply of fodder for Government mules and ponies in that country.

STATEMENT No. VIII.—*Experimental cultivation—Carrot.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		LOWER BURMA.	
1	Akyab ...	Grown in jail garden...	The seeds came up fairly well.
2	Rangoon ...	ditto ...	The Superintendent of Central Prison reports that the quality of the seed received was a very poor one and, although every care was bestowed on the culture and growth, the carrots were small, flavourless, bitter, and of a peculiar colour.
3	Hanthawaddy (Insein).	ditto ...	Seeds failed to germinate.
4	Prome ...	ditto ...	*White seeds*, unsuccessful. *Yellow seeds*, very few came out. *Red seeds*, proved a failure.
5	Prome (Paungdè).	Grown in jail garden. Planted in October.	Proved a success. Their sizes varied from 4 to 12 inches long and circumference near root 3 to 7 inches. Most of them were of a large size.
6	Bassein ...	Grown in jail garden...	Failed entirely owing to heavy rain.
7	Thôngwa (Maubin).	ditto ...	Failed. The seed was not successful in germinating.
8	Henzada ...	ditto ...	Failed to germinate.
9	Toungoo ...	ditto ...	Failed. About five per cent. of the seeds germinated, but the carrots obtained were small and flavourless.
10	Thatôn (Shwegyin).	ditto ...	The seeds germinated well, and the crop was a satisfactory one.
11	Amherst (Moulmein).	ditto ...	Yellow seeds did the best and gave a fairly good outturn but the red seeds resulted in a failure.
12	do. ...	Planted by the Secretary, Agri-Horticultural Society.	The experiment was a complete failure.
13	Tavoy ...	Grown in jail garden...	Partially successful.
		UPPER BURMA.	
14	Magwe ...	Grown in jail garden. Planted in November.	A good crop obtained.
15	Mandalay ...	Grown in jail garden...	The experiment proved fairly successful.
16	Bhamo ...	ditto ...	The experiment was eminently successful.
17	Katha ...	ditto ...	Obtained a satisfactory result.
18	Shwebo ...	ditto ...	The seeds were sown by throwing broadcast in large beds and some by planting in small beds. Both succeeded very well, but the carrots in the small beds grew to a large size and better in flavour than the carrots from the large beds, as the former got a good supply of water daily, whereas the latter were watered once in three or four days.
19	Lower Chindwin (Mônywa).	ditto ...	The experiment proved a success. The carrots produced were rather larger than medium size.
20	Meiktila ...	.....	The experiment tried in the jail garden proved successful. In other places only red and yellow varieties turned out well; the white variety is not popular with cultivators.
21	Yamèthin ...	Grown in jail garden...	Owing to an insufficiency of water the crop was a poor one.
22	Myingyan ...	ditto ...	About one-third of the seeds did not germinate and those that germinated did not come to perfection as there was not sufficient water to irrigate the land after the seeds were sown.

STATEMENT No. IX.—*Experimental cultivation—Castor-oil seed.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA.	
1	Myingyan ...	Superintendent of Jail, Myingyan.	As the castor-oil seed was received very late in the year it was only sown recently. The plants are growing well and should give good results.

G. B. C. P. O.—No. 4308, D., L. R. & A., 26-11-98—240.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1898-99.

RANGOON: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, BURMA. SEPTEMBER 1899.

[Price,—Re. 1-0-0.]

TABLE OF CONTENTS.

REPORT ON THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BURMA, FOR THE YEAR 1898-99.

SECTION I.

Prefatory.

	Para.	Page.
Administration of the department ...	1	1
Tours of Director and Assistant to Director ...	2	2

SECTION II.

Land Records Establishments.

No changes made in the department ...	3	2

SECTION III.

Utilization of Land Records.

Maintenance of township books in districts ...	4	2

SECTION IV.

Scientific and National Enquiry under Imperial Control.

Rainfall and economic products ...	5	3

SECTION V.

Scientific and Local Enquiry under Provincial Control.

Experimental garden in Southern Shan States ...	6	4
Tobacco.		
Experimental tobacco cultivation ...	7	ib.
English vegetable seeds ...	8	ib.
Eucalyptus—Tree tomato.		
Eucalyptus cultivation... ...	9	ib.

SECTION VI.

Agricultural Education.

Qualifications necessary for admission into lower grades of the department ...	10	5

SECTION VII.

Publication of Agricultural information.

Famine analyses of seventeen districts ...	11	5

SECTION VIII.

Final.

Work of the department ...	12	ib.

APPENDICES.

	Page.
Report on experimental cultivation for the year 1898-99 ...	iii.
Statement A.—Actual total receipts and disbursements from the 1st June 1898 to 31st May 1899 (year under report) ...	viii.
Statement B.—Details of disbursements from the 1st June 1898 to 31st May 1899 ...	ib.
List of fruit-trees in orchard, 1898-99 ...	ix.
Statement No. II.—Description of seeds received, together with the cost of consignment and of distribution, during the year 1898-99 ...	xiii.
Statement No. IV.—Distribution list of seed obtained for experimental cultivation during the year 1898-99... ...	xiv.
Statement No. V.—Experimental cultivation—Tobacco ...	xv.
Statement No. VI.—Experimental cultivation—English vegetable seeds ...	xvi.
Statement No. VII.—Experimental cultivation—Eucalyptus seeds ...	ib.
Statement No. VIII.—Experimental cultivation—Tree tomato seeds (*Cyphomandra betacea*) ...	xvii.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

For the year 1898-99.

SECTION I.

PREFATORY.

MR. M. LAURIE, I.C.S., continued in officiating charge of the Department of Land Records and Agriculture from the beginning of the year up to the 20th October 1898, when Mr. T. C. Wilson, I.C.S., returned to his post as Director after a short leave of 3½ months subsequent to his handing over charge of his acting duties as Revenue Secretary to the Government of Burma. On Mr. Wilson's transfer as Officiating Commissioner of the Sagaing division, Mr. H. Thompson, I.C.S, officiated as Director, in addition to his duties as Secretary to the Financial Commissioner. This was from the 28th February 1899 until the close of the year. Mr. Wilson meantime reverted to the regular line and Mr. A. Gaitskell, I.C.S., was appointed permanently as Director from the 17th March 1899, but as he was on furlough at the time he was unable to join his new post till shortly after the year had ended.

Mr. J. C. Clancey, F.R.A.S., on his return from furlough resumed charge of his duties as Assistant to the Director of Land Records and Agriculture on the 18th June 1898, when Mr. R. A. Gibson, the acting incumbent, was transferred as Officiating Settlement Officer of the Meiktila district in the place of Mr. A. E. T. Sarfas, proceeding on leave.

Among the Superintendents of Land Records no changes occurred in the year beyond Messrs. C. W. J Ford and C. P. Torrens, F.R.G.S., receiving grade promotions, from the 4th to the 3rd grade, and four officers going on short leave. Maung Ba On and Maung Shwe Zan Aung, B.A., Superintendents, Henzada and Kyauksè districts, respectively, each went on three months' privilege leave, Mr. R. S. Carrapiett, B.A., officiating in both cases. Mr. C. G. S. Wood, Superintendent, Sagaing district, took a year's furlough from the 15th March 1899, Mr. Carrapiett acting for him also. Mr. W. C. Godfrey, Probationer, Sandoway district, obtained a month's extraordinary leave on private affairs, but no Land Records officer was sent to fill his place during his brief absence, the *Akunwun* of the district taking charge of the current office work in the interval. Messrs. C. P. Torrens, F.R.G.S, Superintendent, Hanthawaddy district, and J. Haddock, F.R.G.S., Superintendent, Mandalay district, respectively, looked after the supplementary survey of the Rangoon Town and Katha districts in addition to their regular work; the former from December 1898 and the latter throughout the year. It is intended to appoint separate Superintendents for these districts later on next year when several new districts will be opened up to supplementary survey, a number of additional superintendents will have to be appointed and the recently sanctioned re-organization scheme relating to the Lower Burma requirements will come into operation. The decision of the Government with regard to the maintenance of the land records and the method of land assessment in Upper Burma necessitates a reconsideration of the whole establishment for the province, and proposals are now being submitted for a large increase in both the supervising staff and the subordinate establishment. The additional work imposed on the Director and his Assistant by these proposals, when sanctioned will be very considerable.

The appointment of a Settlement Commissioner will withdraw a portion of his present work from the Director and he will be able to devote more time to the inspection of supplementary survey work.

The number of Settlement Parties continues the same as before, namely, one regular settlement in Toungoo, in Lower Burma, and two regular settlements in Upper Burma, one in Sagaing and the other in Magwe; one summary settlement in Meiktila-Yamèthin, also in Upper Burma, and three revision settlements in Lower Burma, in Hanthawaddy, Bassein, and Myaungmya-Pegu.

Tours of Director and Assistant to Director.

2. During the month of December 1898 the Director, Mr. Wilson, inspected both the office and the field-work of the Sagaing Settlement Party. In January and the early part of February 1899, he inspected the Land Records offices and the supplementary survey field-work of Bassein, Sandoway, and Akyab, and also the Survey School (in-door portion) at Akyab. He likewise examined the soil classification work of the previous year in the Sandoway district, the field-work of the Hanthawaddy Revision Settlement, and the office and field-work of the Bassein Revision Settlement. Towards the end of the field-season, but after the close of the financial year, the present Director, Mr. Gaitskell, inspected the field-work of the Toungoo and Yamèthin settlements and also of the supplementary survey of the Minbu district, together with the office of the settlement party of the Magwe district. The field-work of the Magwe and Pegu settlement parties could not be examined before the rains had commenced.

Mr. Clancey, Assistant to the Director, during the season, inspected in both Lower and Upper Burma the Land Records offices of 22 districts, the survey schools (in-door as well as out-door, except for Bassein, of which the latter had to be excluded owing to unfavourable weather) at 18 centres, and the supplementary survey field-work in 20 districts. He also inspected the survey sections of the three Revision Settlement offices, the soil classification field-work of Kyaukpyu, the revision survey field-work of Henzada, the special local cadastral surveys (field and office work) in the Thayetmyo, Pegu, Myaungmya, and Thatôn districts, and the office work relating to certain special local surveys executed in the previous year for two other districts.

Thus, by considerable effort, a record amount of inspection work was done in the year. With the exception of the field-work of the Magwe and Pegu settlements, which are referred to previously, all the settlement parties, Land Record offices, survey schools, and special local and revision surveys were inspected by either the Director or the Assistant to the Director. This is extremely satisfactory. The work of the department is still on the increase, and although the appointment of a Settlement Commissioner may afford some relief, the immediate introduction of supplementary survey into the surveyed districts of Upper Burma will enlarge the scope of the department and, in addition to various other duties, the Director and his Assistant will find some difficulty in making the necessary annual inspection of the Land Records work in 31 districts.

SECTION II.

LAND RECORDS ESTABLISHMENTS.

3. This subject is fully dealt with in the Revenue Administration Report. No changes were made in the number of Superintendents and probationers employed in the province, but shortly after the close of the year the number of Superintendents was increased, and a further increase will soon be necessary to meet the requirements of Upper Burma. The number of Inspectors was increased by two in Lower Burma and one in Upper Burma during the year under report.

SECTION III.

UTILIZATION OF LAND RECORDS.

4. This is the fourth year since the orders for the maintenance of township books in districts under supplementary survey were issued. The books are now regularly brought up in all such districts, and their object and preparation are now

well understood everywhere. They have been examined, whenever opportunities offered, by the Director and the Assistant to the Director, and have been found to have been generally correctly written up. In some instances minor defects of entry in regard to areas under occupation were noticed, and in two cases the remarks relating to the agricultural condition of the *kwins* were incomplete. But, on the whole, the books are now carefully prepared and effectually serve the purpose for which they were introduced, namely, to show the state of agricultural progress or decline of each *kwin* in the township and the causes thereof.

SECTION IV.

SCIENTIFIC AND NATIONAL ENQUIRY UNDER IMPERIAL CONTROL.

5. The report on the rainfall of the past year was issued as usual.

The statement below gives the list of the various economic products collected for the Reporter on Economic Products.

Economic products sent for the Indian Museum, Calcutta, and Imperial Institute, London.

Name.	Description of specimen sent.	From where obtained.
Aeschynomene Aspera ...	Toys, artificial flowers and leaves	Mandalay and Southern Shan States.
Alum	The salt	Mandalay and Amherst.
Anacardium occidentale ...	Bark	Amherst.
Andropogan Sorghum ...	Grain, spikes and botanical specimen.	Mandalay, Sagaing, Minbu, and Pakôkku.
Antidesma diandrum ...	Fruits and leaves	Pegu Forest Circle.
Arsenic	Chief forms met with in bazaars	Rangoon and Mandalay.
Borax	.....	Rangoon and Pegu.
Bridelia retusa	Barks and fruits	Rangoon and Amherst.
Broussonetia papyrifera ...	School slates	Amherst.
Carbonate of lime	Limestone	Amherst.
Caruelian (1st rock crystal) ...	Quartz ore	Tavoy and Mergui.
Cements (1st calcareous) ...	Lime, gum, and mortar ...	Amherst and Tavoy.
Cements (3rd glutinous) ...	.....	Rangoon.
Cements (4th resinous) ...	Gum and resin	Prome and Thayetmyo.
Coix lachryma Jobi	Seeds, plants, roots, and fruits ...	Akyab, Kyaukpyu, Northern Arakan, Amherst, Tavoy, Mergui, Pegu, Tharrawaddy, and Katha.
Deer (barking)	Skins	Prome.
Deer (sambur)	Skins	Pegu and Thatôn.
Flacourtia Ramontehi ...	Seeds, fruits, leaves, and oil ...	Tenasserim and Pegu Forest Circles.
Garuga pinnata	Leaves, bark, gum, and fruits ...	Pegu Forest Circle.
Lac	.....	Amherst.
Oryza Coarctata	Plants and grain	Pegu and Thatôn.
Oryza Sativa	.....	Thôngwa and Myaungmya.
Zanthoxylum Budrunga ...	Bark, leaves, and fruits ...	Tenasserim and Pegu Forest Circles.

The most interesting and the best collection made during the year under report was that of *pyaung* or *juar* (Andropogan Sorghum) supplied by the Settlement Officer, Sagaing.

The annual report in the Civil Veterinary Department is not reviewed as part of the departmental report, but is issued separately.

The registration of trade between Burma and the adjacent States is still carried on by this department. The triennial report will shortly be published.

The collection of statistics with regard to the outturn of the principal crops in Upper and Lower Burma by means of crop-cutting undertaken by the district officers will shortly be completed. Those statistics which the Deputy Commissioners consider unreliable and not representative of the average crop are omitted. In Upper Burma the outturns of the various crops in the districts that have not yet come under settlement cannot easily be checked, or accepted as entirely correct.

SECTION V.

SCIENTIFIC AND LOCAL ENQUIRY UNDER PROVINCIAL CONTROL.

6. The report on the experimental garden in the Southern Shan States is now submitted as a separate report and has been published. Comments have already been made on the work of last year and there is no need to add to them here. The report clearly shows that the extension of the wheat cultivation and the more general cultivation of the edible variety of potato depends on the steps that are taken to bring the Southern Shan States in direct communication with Burma by means of a railway.

The wheat experiment in Kēngtūng was not a success last year owing partly to the unfavourable season and partly to the want of attention paid by the cultivators to the preparation of the ground. The experiment on a smaller scale is to be continued this year, and the wheat seed has been despatched to the Superintendent. A small supply of American tobacco has also been sent to him for experiment.

The vegetable garden was carried on at a small profit. A good supply of potato seed was put down, and in the orchard strawberries did better than usual, plum and fig trees fruited well, while the other trees may be expected to yield good fruit in the next few years.

The grape vines have failed and the Superintendent has given up as hopeless the cultivation of currants, gooseberries, cobnuts, filberts, and raspberries. A small sum was obtained by the sale of the fruit for the first time this year.

Experimental gardens were opened at Falam in the Chin Hills and at Sinlumkaba in the Bhamo district, but, as the ground is in course of preparation only, no reports have been received.

The Deputy Commissioner, Myitkyina, has as yet submitted no report on the small gardens at Sima, Sadôn, and Nanyaseik.

Appendix **B**, Statement IV, shows the distribution of seed for experiment in the districts in Upper and Lower Burma.

Tobacco.

7. The results of the experimental cultivation of American tobacco are not very hopeful and the trials in future will be confined to those districts where success has been partially obtained. The seed is generally distributed to Burmese cultivators who grow their own variety of tobacco on the alluvial soil on the islands or banks of rivers. The experiment when made with care and skill is always a success, as proved by the Secretary to the Moulmein Agri-Horticultural Society, but it requires more attention than the cultivator takes the trouble to pay to the local variety and, until some method of curing the leaves other than the Burmese method of sun-drying them can be introduced, the experiment remains still incomplete. The results in the year under report, however, have been more fortunate than usual. From Statement V it will be seen that the experiment was a great success in Myitkyina and the Upper Chindwin. Good results were also obtained in Amherst, Bilin township, Thatôn, Mergui, Thayetmyo, and parts of Shwe bo, Lower Chindwin and Minbu.

English Vegetable seeds.

8. *Statement VI.*—The seeds with the exception of asparagus and broccoli, seem to have done very well under favourable conditions in Upper Burma. The main object of the experiment is to encourage the growth of market gardening in the neighbourhood of towns where Europeans reside. Chinamen are generally the pioneers in the cultivation of vegetables. The experiments may be considered successful when garden cultivators have been induced to grow English vegetables year after year and thus secure an annual supply to those in need of them.

Eucalyptus—Tree tomato.

9. The substance of the reports are given in Statements VII and VIII.

No new agricultural implements were introduced or tested during the year and the Sultan water-lift has not proved useful to the cultivators.

SECTION VI.

AGRICULTURAL EDUCATION.

10. The qualifications hitherto required for admission into the lower grades of the department continue in force. In addition to the training received by pupils in Survey Schools, a practical course in surveying is also required from those who aspire to become surveyors. This training in field-work was obtained in the various Imperial or Provincial Cadastral Survey parties which were at work in the country, but latterly owing to the curtailment of the operations conducted by such parties it became necessary to supplement this method of practical training by also allowing passed students to accompany Inspectors of the Land Records Department during the field-season.

SECTION VII.

PUBLICATION OF AGRICULTURAL INFORMATION.

11. The famine analyses for 17 districts in Upper Burma and three districts in Lower Burma were revised and published. Minor errors in the preparation of the forms of some district analyses have been discovered, and the Deputy Commissioners concerned have been asked to correct them.

The weekly crop reports afford early intimation of the prospects of the harvest of each crop and fluctuations in the wholesale and retail prices of food-grains are regularly published.

The forecast of the amount of the rice crop available for export was as usual published, and the surplus thus estimated was 1,486,000 tons cargo rice. The export up to date has reached 714,523 tons. Compared with last year, much less has been exported to India, the Straits and China, and more to Europe.

A forecast of the cotton crop is also to be published in the ensuing year.

SECTION VIII.

FINAL.

12. The Land Records Department continues to deal with the same subjects as were under its charge in former years.

A. GAITSKELL,
Director of Land Records and Agriculture.

The 29th July 1899.

APPENDICES.

REPORT ON EXPERIMENTAL CULTIVATION FOR THE YEAR 1898-99.

THIS is the eighth annual report, though the first trees planted in the orchard were only planted in 1893, six years ago.

2. *Grant.*—The grant for the year was Rs. 4,070, or Rs. 1,600 less than last year. It has been ample to meet requirements.

3. *Expenditure.*—The total expenditure under all heads has been Rs. 3,248 as against Rs. 3,125 last year. The full details are given in Statement B, annexed.

4. *Receipts.*—There has been a large falling off of receipts for sales, as there have been no credits under the head of wheat, which used to realise a large amount yearly. While I was away on furlough last year it was considered that wheat had got beyond the experimental cultivation stage and it is now left to the management of the *Sawbwa* of the Stage (Yawnghwe) and his cultivators. The receipts under all heads therefore only reach the total of Rs. 1,807.

5. *Work for the year.*—The work has been under considerable disadvantages as I have been away nearly the whole year; on furlough till December and then on tour till the end of March; and the management of the cultivation generally has been left in the hands of Maung Sè, the head gardener, supervised by Mr B. S. Carey, who was officiating for me during my absence, and who wrote the report for last year. As *locum tenens* he very considerately allowed matters to go on as they were, and did not interfere with the head gardener. The head gardener is a Burman who has learnt all he knows in the orchard. He has done exceedingly well and the trees under his care have progressed favourably, while the vacancies that occur here and there among the fruit trees he has done his best to fill up, and his pruning and grafting has been successful. There is one rather serious omission, however. He neglected to sow any nurseries for stock for grafting on last rains, and he has neglected to collect the seed of the wild stock for sowing during the rains, an omission which with the plum and peach seed it was too late in the year for me to remedy after my return, though I was fortunately in time to obtain both apple and pear and cherry, of which I have now some nice young nurseries. The loss, however, will be felt financially for the next two years as, instead of commencing in the year under report to offer these young trees for sale, I have only been able to do so to a very limited extent and next year there will be fewer still. In former years all the young trees we could grow have been required for planting up the orchard.

A small start, however, has been made at selling the trees and the demand for trees by the Chiefs has been very much larger than I had expected. A start has also been made to sell the ripe fruit locally, which has contributed a little to the receipts and has enabled those that liked to obtain them. The trees in about 20 acres have been well mulched with farmyard manure during the year and the pruning has been fairly well attended to. Potatoes have been grown again between the rows of trees, which has kept the soil loose and has proved a fairly remunerative crop, though as usual the greater part of the receipts is swallowed up in cart-hire to the railway.

The vegetable garden has been kept up during the year and is now well stocked, and for the first time sea kale has been cultivated of as good quality and flavour as in England. Some 300 more trees have been planted on the roadsides in the station, of eight varieties. all of which are shade giving and most of them have pretty and sweet-scented flowers, They are all indigenous to the Shan States and the nurseries were formed in 1897. Two-hundred rupees have been spent in planting and protecting these.

Some new varieties of flowers have been added to the previous stock, at a cost of Rs. 325, and large quantities have been distributed of the sorts that have become fairly established.

6. *General remarks.*—Local labour only has been employed as heretofore, but now that the orchard has become nearly complete in formation and stock the outside labour required is not much.

The old roots of the original scrub-jungle have stooled up to a considerable extent and one of the works to be done this year will be to grub it up. A commencement has already been made and I am endeavouring to do it as much as possible by the regular establishment.

Now that the trees have commenced to fruit, I find that it is impossible to employ gangs of irresponsible coolies without the fruit, and often the trees, suffering.

The year has been a most trying one in consequence of the drought. The rains ceased early in October and in November there was only 10 cents. From then till the end of April there was not a drop and then only 94 cents fell, in two showers. It then commenced to rain on the 4th May and there were 13 inches before the end of the month.

The result of this abnormal weather has been that the potatoes put in in *October* for the cold weather crop did not germinate till the rains came in *May*. They now look a most luxuriant crop.

The strawberries, so long as they could be irrigated sufficiently, were unusually productive, but small.

The peach trees were loaded with fruit but there was not sufficient moisture in the soil to fill until the rains of May and then there was a plague of beetles (Curculio) which bored small holes into each fruit, into which the incessant rain entered and they commenced to rot at the core when barely ripe. The fruit that was spared was most excellent, though small, but there was enormous waste and the crop came to an end before the end of the month (May).

7. *Establishment.*—The establishment remains the same as it has been since 1897, namely, a head gardener and three under-gardeners, and four coolies.

Maung Sè, as head gardener, pure and simple, has done his work entirely to my satisfaction during my absence on leave. He has failed, however, in his temporary administrative capacity in the matter of nurseries for young stock, and as these were matters which I used to attend to myself he is scarcely to be blamed. The three under-gardeners have now been working from three to four years and are acquiring some knowledge of the work. There have been considerable changes in the clerk's post, which has resulted in some confusion in the labelling, &c., but the present man, Maung Po Si, appears to take much interest in the work and will, I think, do well.

8. *Vegetable Gardens.*—The prolonged drought and the consequent shrinkage of the water-supply made it very hard to keep up a good stock of vegetables during the dry months, so that I had to reduce the households supplied to five, and this is, in fact, quite as many as the garden is able to supply with regularity.

The new beds for asparagus were prepared, but on my return I could not get seed either in Rangoon or Calcutta, and by the time I had ascertained that, I had left on tour, and nothing more can now be done until later. In the meantime the old beds, made in 1891-92, are supplying our wants, and though the heads are not as fine as they used to be there are still large quantities of them and of excellent flavour.

I have been experimenting on the growth of sea kale now for three years, but have never succeeded in bleaching it without the plants rotting off until this year. Last year I had the plants moved on to a raised bank so as to improve the drainage in the rains, and they grew very luxuriantly there. I did not attempt, however, to bleach and grow for consumption, but was content to get a good stock of plants well established to try a method on that I hoped would succeed. When I returned in December the plants had died down for the winter and I had had sand piled over them to a height of some 15 inches. The experiment has been most successful so far, as the plants have come up most luxuriantly through the sand and the cuttings have been long, white and tender. Cuttings commenced in March and each plant has now given three luxuriant cuttings and are still growing well in spite of the constant rainfall. At present they show no signs of rotting, as they used to when I attempted to bleach them under pots as is done in Europe.

The stock of rhubarb has, I regret to say, diminished, and this time not on account of the heavy rain, as I have it now on a ridge like the sea kale, but from the prolonged drought. I have not yet found out the way of growing this very desirable plant, with any degree of certainty, though some years we have had some excellent stalks.

The tubers of Jerusalem artichokes have also dried up in the prolonged drought and but few have germinated. I cannot succeed in keeping these tubers round from year to year.

The total expenditure on the vegetable garden has been Rs. 185 and the receipts Rs. 216, leaving a small balance in its favour of Rs. 31.

9. *Wheat.*—Under this head nothing has been done, no expenditure and no receipts. The abnormally short rainfall since early in October 1898 has spoilt the crops of the cultivators, so that instead of getting 18 lacs of pounds for the Commissariat at Fort Stedman, it was feared at one time that there would not be more than 6 lacs, but the latest information is that the crop is estimated at 10 lacs.

It is, however, entirely out of my hands and I have no means of accurately gauging its progress. An experiment in the growth of this cereal was made at Kēngtūng for the supply of the Commissariat Department there, but it was quite independent of this grant, and beyond the fact that the crop failed I have at present no information.

This severing of the wheat experiment from this grant is to be regretted financially, and I fear that under the present management the industry is likely to decline.

10. *Potatoes.*—Nine hundred and eighty viss of potatoes were put in the ground in the first week of October 1898. The rains ceased immediately afterwards and not one germinated for the cold-weather crop. The tubers, however, lay in the ground and apparently kept better there than in the godown, as there was no rain to start them. They all sprang into life with the rain in May and scarcely a tuber is missing in the rows.

As it was upon this crop that we depended for our seed to put in in April for this rain's crop there was some difficulty in obtaining seed. Fortunately there was a good balance of

the 2,000 viss set aside for sale for local comsumption and from that source, by stopping all sales, I got 960 viss, and as they were not sufficient for the land that had been prepared for them, 361 viss were imported from the Myelat, so that, with the 760 viss put in in October, there is now in the ground—

	Viss.
Sown in October 1898	980
Sown in April 1899 from home-grown seed	960
Sown in April 1899 from Myelat	361
Total ...	2,301

All the seed in the ground is from the new seed obtained from Calcutta in 1897, with the exception of the 361 viss from the Myelat, and they are all kidney and probably from the same source also, as 3,000 viss was distributed in the Myelat for seed in 1897. Nothing could look better than the crop in the ground, which I have already had to get hoed once, and a second hoeing will be necessary immediately, their growth is so rapid. The outturn of the crop dug in August and September 1898 was 10,205 viss from the 760 viss of seed put in in the previous April or about fourteen-fold.

There was the same difficulty in disposing of the crop as heretofore; 7,000 viss were sent and sold at Thazi, 106 miles by cart, which cost Rs. 420 cart-hire. The balance was sold locally. The total receipts for potatoes was Rs. 1,173.

The growth of this tuber in the Myelat has now become so general and extensive that it is impossible to estimate the outturn as could be done in former years. As I have no means of measuring the increase in the growth of these tubers, now that the growth has become so general, I have referred to the "Memorandum on the trade between Burma and the adjoining foreign countries for the year ending March 1898," which is the latest I have received and "Potatoes" are nowhere to be seen. They are apparently amalgamated with other vegetables under some one general heading. I think the import of this article of merchandise into Burma has now become so large that it should be shown under a separate heading, "Potatoes." It would then be of much use to me to gauge the truth of the reports I get of the increase or decrease of the area under this cultivation.

11. *Orchard.*—The strawberries have done better than usual. There has been an unusual amount of sun and, as long as the effects of the sun in the daytime could be counteracted by a copious supply of water in the evening, the plants were red with berries. They commenced to fruit in December, and in December and January the berries were very fine indeed. In February they were good: in March they fell off from some reason in size and flavour; but in April again they were good so long as the water lasted. Towards the end of April the water-supply became deficient and I dug up half the beds, so as to air the soil before planting up again in July.

Finding that the crop was to be a heavy one I devised a means whereby the berries could be obtained from the orchard at eight annas per viss of 3½ lbs. or four annas for half viss.

In this manner during the months of January, February, March and April, 175½ viss = 614 lbs. were distributed throughout the station, the receipts benefitting to the extent of Rs. 88. When the strawberries commenced to fail towads the end of April the peaches commenced, but the insects and heavy rain all through May caused them to fall off and rot to a very wasteful extent, so that, although there were many more trees in fruit than in the year previous, only 40 viss = 140 lbs. were picked; the rest were useless. Those which were picked were very small owing to the prolonged drought, but of excellent flavour owing to the long and continued bright weather. As soon as the rain commenced in May came a regular insect pest, the principal sinner being a *curculio* which pierced the skin and made a small hole into the flesh of the fruit. The rain then entered and decomposition round the stone set in. Having ascertained how to grow the fruit, a somewhat complex problem seems now to present itself as to how to preserve it from these insect pests. Is it to be cotton netting somewhat similar to mosquito netting used in England to keep off the wasps and flies? Or it is to be done by spraying and, if so, with what? I should be glad of advice on this subject from any casual reader.

There are a good many nectarine trees laden with fruit, but they are very late flowerers and the fruit is still quite green. A few of the apricot trees flowered for the first time, but have not set a single fruit.

The plum trees which commenced to fruit in 1897 had heavy crops, and some young trees have also commenced to fruit this year. There were only a few berries on each, but, such as there were, were of excellent flavour.

One cherry tree showed flower this year, but set no fruit. The enormous growth of the various kinds of cherries that I budded on to the wild cherry stock of the country in 1897 is truly wonderful. They are already four times the size of the trees on the English stock imported and planted in 1892, 1893 and 1894, although the latter look healthy enough. The cherry on English stock makes about as much growth *per annum* in *inches* as the cherry on indigenous stock does in *feet*.

The pear trees show no signs of flowering as yet, though some have been planted since 1892. The growth of those grafted in 1887 on to indigenous virgin stock (*Pyrus Pashia*) hsa been very good and there are no vacancies. The apple trees throughout the orchard are doing well and there are several young trees, with large bunches of fruit now on them, that were grafted in February and March 1897 on to virgin stock of the *Docynia Indica*, the wild apple or what is its equivalent of these parts.

I am quite satisfied that much progress has been made since I commenced to use this stock in 1895, and whereas some 80 per cent. were failures in 1896 from 80 to 90 per cent. are now successful. This is owing principally to always taking the scions from last year's grafts so that the scions put in this year have been grown on *Docynia Indica* stock for three generations. Something is no doubt also due to the greater experience of the head gardener in selecting his scions.

I am quite convinced that the only stock to be used in this country is *Docynia*, which, as far as my orchard is concerned, will soon be completely stocked with trees growing on it. This year out of some hundreds grafted on this stock not one per cent. have as yet showed any signs of dying in the manner described by me in my report for 1896-97, paragraph 11. It is too early in the year yet, however, to know what the results will be. No nurseries having been made last year I had only a few hundred grafts put in. Next year I hope to graft some thousands and, as I shall be at hand to watch the progress, I will defer statistics till then.

There are two of the young quince trees fruiting this year. The grape vines are a total failure. I mean to try some from Chitral or that neighbourhood, which Mr. Gollan, the Superintendent of the Gardens at Saharunpore, has kindly promised me.

The figs are full of fruit and doing well, but June and July are the months when they have been previously harried by the *Longicornis* beetle, the larvæ of which bore down the centre of the stems of the shoots, so that it is early to say yet how far they will escape.

The currents, gooseberries, cobnuts and filberts are all, or nearly all, extinct. They cannot be grown here. The walnuts look well, but grow very slowly. Raspberries are also a total failure. The ones I imported from Ootacamund in 1896 have all died.

It is curious when four species of indigenous raspberries luxuriate, the imported plant will not live. The orange trees have grown well, but they show no signs of fruiting as yet. Some are flowering this year for the first time.

During the year Rs. 136 has been credited on account of sale of fruit trees for the first time. Besides this the following trees are said to have been distributed gratis, but from the many changes in clerks a good many trees have been given away that do not appear on the register :—

	Trees.
Apple	12
Plum	2
Cherry	27
Pear	25
Peach	10
Strawberry	500
Apricot	2

12. *Flowering plants.*—Of the plants imported in 1897 the dahlias, begonias, and violets are most vigorous and flourishing. I am unable to say how far the narcissus, daffodils, and hyacinths have progressed as they are planted out in the garden and have not flowered as yet since my return.

Taking advantage of returning from furlough I brought out with me two wardian cases of plants as I could look after them on the voyage. In spite of all my care some azaleas, all the boronias, one plant of tramandia, and 11 out of 12 bonvardias died, either on the journey or since; but four dozen plants of different kinds of roses, three dozen bulbs of caladiums, half dozen azalea-mollis, half-dozen azalea-ponticum; half dozen camelias; half dozen tree peony are all now safe and doing well.

During the year large quantities of plants of geraniums, chrysanthemums, dahlias, roses, and many other plants have been distributed gratis. The registration of these has been so faulty that I will not attempt to quote figures, but 418 rose trees have at least been so distributed.

13. *Financial.*—From Statement A Rs. 2,488 has been spent on the orchard, while from sales of produce Rs. 1,591 only has been credited, leaving it Rs. 897 to the bad.

Of the expenditure, Rs. 325 has been in the additions to the collection of flowering plants, Rs. 200 in planting and guarding roadside trees, and Rs. 185 in the purchase of four new bullocks, as the former ones purchased in 1892 have become too old and feeble for work. These are not recurring charges and represent capital, and, if these are eliminated, the net charges on behalf of the garden and receipts from its produce has nearly balanced.

Next year should have shown a large increase in receipts for young fruit trees, but the not having made nurseries last rains will obviate this, and the not having collected seed for plum and peach nurseries in the season of 1898 will throw the sale of those trees back for one year longer. The orchard therefore can scarcely expect to show a balance on the right side for two years to come as the local sale of fruits is a very precarious receipt.

The vegetable garden held its own and left a small balance to credit and, as long as it does that, it may be permitted to continue.

The loss of the receipts from wheat is the factor wanting to balance the account, but, if the present arrangement for growing wheat was likely to be a success, the small loss in this account would not be felt. As it is, however, I fear there will not be the same keenness to grow as heretofore and that the decline of the industry is merely a matter of time.

14. *Concluding remarks.*—The results of the experiments for the year may, I think, be considered satisfactory under the administration of Mr. B. S. Carey. A list of the trees now standing in the orchard is appended, from which it would appear that they have been taken good care of.

The deaths among them are much fewer than usual in spite of the excessively and abnormally dry season. The young apple trees are full of fruit and look most vigorous and promising.

The sale of young trees and of fruit has made a very promising start and there is a larger demand for the former among the Chiefs than I could have anticipated.

Until we have a railway, though only a light, narrow-gauge one, the growth of fruit as with wheat and potatoes cannot get beyond the experimental stage, and that only within a radius of 100 miles or so of the present railway. Beyond that radius, except for the local consumption of Europeans or Military, it is useless to endeavour to introduce such crops as they are not used by the people.

As it is the same in the other branches of my administration with reference to timber, minerals, &c., I have come to feel that we have now done all we can do without a railway of some sort and that further exertions are useless.

TAUNGGYI:
The 2nd June 1899.

A. H. HILDEBRAND,
Superintendent and Political Officer,
Southern Shan States.

STATEMENT A.—*Actual total receipts and disbursements from the 1st June 1898 to 31st May 1899 (year under report).*

Receipts.	Amount.	Disbursements.	Amount.
	Rs. A. P.		Rs. A. P.
(1) By budget allotment ...	4,070 0 0	(1) On orchard	2,488 9 9
(2) Sale of vegetables	216 0 0	(2) On garden	185 8 0
(3) Sale of peach	1 10 0	(3) On potatoes	573 14 0
(4) Sale of fruit trees	136 8 0		
(5) Sale of strawberry fruits ...	87 12 0		
(6) Sale of potatoes	1,173 6 2		
(7) Sale of wheat	192 13 3		
Total ...	5,878 1 5	Total ...	3,247 15 9

STATEMENT B.—*Details of disbursement from the 1st June 1898 to 31st May 1899.*

Details.	Amount.
	Rs. A. P.
(1) Establishment	1,514 0 0
(2) Cost of fruit-trees	215 5 0
(3) Cost of shipping, wharfage, &c., on fruit-trees	54 6 0
(4) Cost of cart-hire, &c., for conveying fruit-trees	40 6 0
(5) Coolie-hire for building shed for fruit-trees	10 8 0
(6) Cost of baskets	5 4 9
(7) Cost of nine boxes for packing fruits	3 6 0
(8) Cost of box and cloth for packing strawberries	0 15 0
(9) Cost of one French Secateur	3 8 0
(10) Cost of *indwe, thitse,* and wax	20 14 0
(11) Cost of coolie-hire for conveying, digging pits, &c., for planting banian trees ...	43 8 0
(12) Cost of 100 gabions for trees	150 0 0
(13) Cost of four bullocks	185 0 0
(14) Cost of tools	15 0 0
(15) Coolie-hire for clearing jungles	115 0 0
(16) Cost of thatch, materials, &c., for repairing sheds	14 10 0
(17) Cost of repairing Government carts	15 0 0
(18) Cost of two kegs of paint	5 4 0
(19) For repairing gates	13 3 0
(20) Herding Government bullocks	57 8 0
(21) Miscellaneous	6 0 0
Total ...	2,488 9 9
Garden.	
(1) Establishment	168 0 0
(2) Cost of vegetable seeds	11 8 0
(3) Coolie-hire for removing gardener's house	6 0 0
Total ...	185 8 0
Potatoes.	
(1) Conveyance (cart-hire)	420 0 0
(2) Sowing (coolie-hire)	24 4 0
(3) Hoeing (coolie-hire)	39 4 0
(4) Digging and collecting (coolie-hire)	59 0 0
(5) Cost of seeds	31 6 0
Total ...	573 14 0
Total expenditure up to 31st March 1899, from the 1st June 1898—	
(1) Orchard	2,109 10 9
(2) Garden	154 0 0
(3) Potatoes	525 4 0
Total ...	2,788 14 9
Total expenditure from 1st April 1899 to 31st May 1899—	
(1) Orchard	378 15 0
(2) Garden	31 8 0
(3) Potatoes	48 10 0
Total ...	459 1 0
Grand Total from 1st June 1898 to 31st May 1899—	
(1) Orchard	2,488 9 9
(2) Garden	185 8 0
(3) Potatoes	573 14 0
Total ...	3,247 15 9

List of Fruit Trees in Orchard, 1898-99.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From grafts, 1895.	From grafts, 1896.	From grafts, 1897.	From grafts, 1898.	Buds and grafts. Alive.	Buds and grafts. Dead.	Total of each.	Total, 1897.	Increase.	Decrease.	Stocks.	Stocks grafted and failed.
	Apples.															
1	Worcester pearmain	11	...	...	2	1	1	4	...	1	19	21	...	2	...	...
2	Rymer	...	...	3	...	3	5	20	...	3	31	12	19	...	...	...
3	Cornish jelly-flower	...	...	3	7	2	3	13	1	1	29	12	17	...	...	...
4	Sturmer pippin	1	...	...	...	...	1	6	2	...	10	4	6	...	...	...
5	Duke of Devonshire	...	1	...	...	...	...	..	5	..	6	1	5	...	...	...
6	Bramley's seedling	15	...	...	3	...	2	6	...	1	26	26	...	..	...	...
7	Hawthornden	...	1	1	1	4	2	8	13	...	30	7	23	..	...	...
8	Cox's orange pippin	5	..	...	5	28	10	83	174	8	305	71	234	...	...	...
9	Stirling castle	16	...	...	2	2	1	1	...	...	22	22	...	...	...	...
10	Blenheim orange	19	...	...	4	11	7	34	29	2	104	48	56	...	...	...
11	Dutch mignonne	...	1	...	3	...	2	2	15	...	23	7	16	...	...	...
12	Mannington's pearmain	1	...	..	1	...	3	1	5	...	11	9	2	...	...	...
13	New Northern greening	7	2	...	5	6	7	14	7	...	48	19	29	...	...	...
14	Devonshire quarrenden	4	...	...	2	2	...	...	...	...	8	11	...	3	...	...
15	Ecklenville seedling	14	...	...	2	7	11	33	10	2	77	47	30	...	...	...
16	Syke-house russet	...	...	1	...	...	...	5	...	1	6	1	5	...	...	...
17	Rebston pippin	9	...	...	5	2	2	18	4	...	40	18	22	...	...	...
18	King of pippin	6	3	...	1	3	2	2	...	1	17	19	...	2	...	...
19	Lane's Prince Albert	11	...	...	1	...	4	3	2	1	21	17	4	...	...	...
20	Dumelow's seedling	10	...	...	2	17	10	17	14	2	70	50	20	...	...	...
21	The Queen	12	...	...	3	6	10	13	2	1	46	34	12	...	...	...
22	Warner's King	15	...	...	2	5	11	13	13	...	59	34	25	...	...	...
23	Anne Elizabeth	7	...	...	2	1	9	6	7	...	32	19	13	...	...	...
24	Bess Pool	2	...	...	...	...	...	...	...	...	2	2	...	...	...	...
25	Golden white pearmain	3	...	...	4	1	3	17	2	4	30	31	...	1	...	...
26	Lord Grosvenor	10	...	...	...	...	2	...	...	...	12	12	...	...	...	...
27	Cox's pomona	6	...	...	...	6	1	2	1	1	16	17	...	1	...	...
28	Cockle pippin	...	...	2	...	...	1	...	...	...	3	4	...	1	...	...
29	Northern greening	...	...	...	...	...	1	...	...	...	1	25	...	24	...	...
30	Celine pippin	7	...	...	4	4	1	1	2	2	19	25	...	6	...	...
31	Wodhurst pippin	...	2	...	...	1	...	2	1	...	6	11	...	5	...	...
32	Early harvest	...	1	...	...	...	...	...	18	...	19	1	18	...	...	...
33	Newton pippin	...	2	...	...	...	...	5	7	...	14	6	8	...	...	...
34	Good seed field	2	...	...	4	3	...	..	6	...	15	8	7	...	...	...
35	Fairy	...	3	...	1	1	...	...	...	...	5	6	...	1	...	...
36	Nonpariel	...	...	..	...	1	...	...	2	...	3	1	2	...	...	...
37	New Hawthornden	10	...	...	...	...	...	4	...	2	14	13	1	...	...	...
38	Golden Reineth	...	2	...	1	...	2	2	1	...	8	7	1	...	...	...
39	Golden Harvi	...	...	...	...	...	...	...	1	...	1	...	1	...	...	...
40	Kentish pippin	...	3	...	1	1	...	1	...	...	6	6	...	...	...	...
41	Melon pippin	...	1	...	1	...	...	...	2	1	4	4	.	...	...	...
42	Osten pippin	...	2	...	1	...	...	...	39	...	42	4	38	...	...	...
43	Francis pippin	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...
44	Almora, No. 1		...	2	2	...	...	5	3	...	12	2	10	...	...	...
45	Almora, No. 3	...	...	...	...	...	...	1	...	...	1	4	...	3	...	...
46	Peas good-non-such	13	...	...	3	3	2	9	1	1	31	28	3	...	...	...
47	Yellow Fugestin	5	...	...	...	1	1	1	1	...	9	9	...	...	...	...
48	Tyler's kernel	10	...	...	...	1	...	3	...	2	14	18	...	4	...	...
49	Lord Suffield	10	...	...	...	5	8	4	1	...	28	24	4	...	...	...
50	Gascoigne's seedling	5	...	...	...	4	1	2	...	1	12	9	3	...	...	...
51	Grenadier	5	...	...	...	...	1	4	1	...	11	9	2	...	...	...
52	Gold medal	7	...	...	...	2	...	1	...	...	10	9	1	...	...	...
53	Duchess of Oldenburg	10	...	...	1	...	...	...	31	...	42	10	32	...	...	...
54	Chelmsford wonder	5	...	...	...	...	...	...	...	...	5	5	...	...	...	...
55	Lady Sudely	3	...	...	...	1	1	...	...	...	5	5	...	...	...	...
56	Frogmore prolific	5	...	...	...	...	...	...	...	...	5	5	...	...	...	...
57	Pott's seedling	5	...	...	...	1	...	...	...	...	6	6	...	...	...	...
58	Golden spire	5	...	...	...	...	...	1	...	...	6	7	...	1	...	...
59	Beauty of Bath	5	...	...	...	...	3	1	...	...	9	9	...	...	...	...
60	Tower of Glaims	5	...	...	...	...	1	...	...	...	6	7	...	1	...	...
61	Bismark	3	...	...	...	...	...	...	...	...	3	3	...	...	...	...
62	Irish peach	10	...	...	...	...	1	1	...	...	12	11	1	...	...	...
63	Mr. Gladstone	5	...	...	...	5	...	...	...	...	10	9	1	...	...	...
64	Sandringham	5	...	...	...	1	...	2	...	...	8	7	1	...	...	...
65	Without label	...	...	...	...	...	...	...	...	...	13	11	2	...	...	...
66	Cornish aromatic	...	...	...	...	...	...	1	...	...	1	...	1	...	...	...
	Carried over ...	324	25	12	76	142	133	372	423	38	1,520	900	675	55	...	...

List of Fruit Trees in Orchard, 1898-99—continued.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From grafts, 1895.	From grafts, 1896.	From grafts, 1897.	From grafts, 1898.	Buds and grafts. Alive.	Buds and grafts. Dead.	Total of each.	Total, 1897.	Increase.	Decrease.	Stocks.	Stocks grafted and failed.
	Apples—concluded.															
	Brought forward ...	324	25	12	76	142	133	372	423	38	1,520	900	675	55	...	...
67	Cox's golden drop	...	...	...	...	...	...	...	1	...	1	...	1	...	...	...
68	Favourite	...	...	...	...	...	...	...	3	...	3	...	3	...	...	...
69	Easter pippin	...	...	...	...	...	...	...	2	...	2	...	2	...	...	...
70	Stocks	...	...	...	...	...	...	...	...	...	...	...	...	...	362	...
71	Stock grafted	...	...	...	...	...	...	...	...	...	...	...	...	...	...	100
	Total ...	324	25	12	76	142	133	372	429	38	1,526	900	681	55	362	100
	Pears.															
1	Marie Louise	6	4	...	26	7	...	6	...	...	49	49	...	...	...	...
2	Victoria	...	2	...	12	3	...	3	...	...	20	21	...	1	...	...
3	Louise Bonne de Jersey	14	2	...	8	6	...	5	...	...	35	32	3	...	...	...
4	Doyenne du Comice	15	...	...	2	1	...	...	...	...	18	24	...	6	...	...
5	Gloat Morceau	10	...	...	1	...	...	1	1	1	13	11	2	...	...	...
6	Jargonelle	17	2	...	38	37	...	19	1	1	14	112	2	...	...	...
7	Thomsons	...	...	...	1	...	...	...	...	...	1	1	...	...	...	...
8	Beurre superfine	5	...	...	1	10	...	...	...	...	16	17	...	1	...	...
9	Flemish beauty	...	2	1	16	7	...	4	1	1	31	25	6	...	...	...
10	Pitmaston Duchess	10	...	...	9	1	...	3	...	1	23	23	...	...	...	...
11	Easter Beurre	12	...	...	16	19	...	7	1	1	55	55	...	...	...	...
12	Huyshe's Bergamotte	...	2	...	15	4	...	1	...	...	22	24	...	2	...	...
13	Bergamotte D'Esperen	11	...	...	2	5	...	...	...	...	18	16	2	...	...	...
14	Williams' Bon Chretien	13	...	...	7	15	...	1	...	1	36	35	1	...	...	...
15	Winter Nelis	7	...	...	4	8	...	3	1	...	23	23	...	...	...	...
16	Cattillae	6	...	...	3	2	...	...	...	...	11	11	...	...	...	...
17	China	...	1	...	...	...	...	4	1	...	6	1	5	...	...	...
18	La Comte	...	25	...	51	12	1	19	1	1	109	98	11	...	...	...
19	Kreffer	...	34	...	63	6	...	78	13	5	194	100	94	...	...	...
20	Conseiller de la Cour	7	...	...	3	5	...	1	...	...	16	15	1	...	...	...
21	General Todleben	7	...	...	6	20	...	9	...	...	42	31	11	...	...	...
22	Beurre Diel	7	...	...	8	15	...	23	...	...	53	29	24	...	...	...
23	Revers Fertility	7	...	...	1	2	...	2	...	...	12	10	2	...	...	...
24	Beurre Hardy	9	...	...	3	12	...	1	...	...	25	26	...	1	...	...
25	Beurre D'Amanlis	11	...	...	1	5	...	2	...	...	19	27	...	8	...	...
26	Doyenne du Boussoch	6	...	...	3	4	...	3	...	...	16	15	1	...	...	...
27	Uvedale St. Germain	3	...	...	...	6	...	...	...	...	9	10	...	1	...	...
28	Fondante D'Autumn	4	...	...	...	6	1	1	...	...	12	12	...	...	...	...
29	Beurre Ravee	10	...	...	...	1	...	...	...	...	11	12	...	1	...	...
30	Duchess D'Angouleme	5	...	...	1	5	...	1	...	...	12	11	1	...	...	...
31	Beurre D'Aremburg	4	...	...	...	1	...	...	...	...	5	6	...	1	...	...
32	Hassell	4	...	...	...	16	...	...	...	1	20	21	...	1	...	...
33	Brockworth Park	4	...	...	...	4	...	1	1	...	10	8	2	...	...	...
34	Doyenne D'Ete	3	...	...	...	...	...	...	...	...	3	2	1	...	...	...
35	Magnate	5	...	...	...	3	...	...	...	...	8	9	...	1	...	...
36	Clapp's favourite	12	...	...	...	7	...	1	...	...	20	19	1	...	...	...
37	Souverine de Congress	4	...	...	...	...	...	...	...	...	4	6	...	2	...	...
38	Gratisle of Jersey	2	...	...	...	12	...	2	...	1	16	15	1	...	...	...
39	Treyve	4	...	...	...	16	...	...	...	...	20	17	3	...	...	...
40	Beurre D'Assumption	10	...	...	...	...	...	...	...	...	10	10	...	...	...	...
41	Comte D'Lamy	5	...	...	...	3	...	...	...	...	8	9	...	1	...	...
42	Beurre Bachelier	4	...	...	1	18	...	3	...	...	26	27	...	1	...	...
43	Beurre de Clairgeau	2	...	...	...	...	...	...	...	1	2	3	...	1	...	...
44	Barrone D'Mello	4	...	...	1	8	...	2	...	...	15	14	1	...	...	...
45	Passe Colmar	3	...	...	...	...	...	...	...	...	3	3	...	...	...	...
46	Beurre Capeaumont	4	...	...	...	4	...	...	...	1	8	9	...	1	...	...
47	Durandean	2	...	...	...	...	...	...	...	...	2	3	...	1	...	...
48	Josephine D'Malenes	4	...	...	...	...	...	...	...	...	4	6	...	2	...	...
49	Pear without label	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
50	Pear stock	...	...	...	...	...	...	...	...	...	...	...	...	...	17	...
60	Pear stock grafted	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
61	Pear without label	...	...	...	...	...	...	...	...	...	10	9	1	...	...	...
	Total ..	282	74	1	303	316	2	206	21	16	1,215	1,072	176	33	17	2

List of Fruit Trees in Orchard, 1898-99—continued.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From grafts, 1895.	From grafts, 1896.	From grafts, 1897.	From grafts, 1898.	Buds and grafts. Alive.	Buds and grafts. Dead.	Total of each.	Total, 1897.	Increase.	Decrease.	Stocks.	Stocks grafted and failed.
	Plums.															
1	Kabul greengage	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...
2	Guthrie's late greengage ...	...	2	...	3	4	...	1	...	1	10	11	...	1	...	...
3	Prince Englebert ...	5	...	...	1	3	...	...	...	1	9	12	...	3	...	...
4	Rune Claude de Violette ...	...	2	...	...	...	...	...	...	...	2	2	...	...	...	...
5	Jefferson	2	2	...	2	1	...	...	1	2	8	11	...	3	...	...
6	Washington	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...
7	Victoria	4	...	...	1	6	...	...	...	...	11	12	...	1	...	...
8	Early prolific	6	2	...	12	8	1	...	7	1	36	35	1	...	...	...
9	Alucha, black	...	1	...	..	...	...	...	...	...	1	1	...	...	...	...
10	Chettenden damson ...	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...
11	Black diamond... ...	5	...	...	1	1	...	...	...	1	7	8	...	1	...	...
12	Cox's golden drop ...	3	3	...	4	2	...	6	...	1	18	17	1	...	...	...
13	Early dwarf, yellow ...	...	1	...	...	...	...	...	...	...	1	2	...	1	...	...
14	Greengage	3	...	...	1	1	...	3	...	3	8	7	1	...	...	...
15	Bruhy's greengage ...	...	...	2	3	...	...	...	...	...	5	4	1	...	...	...
16	Smith's purple prolific ...	3	...	...	...	.	...	...	...	...	3	2	1	...	...	...
17	Alucha, red	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...
18	Denniston's superb ...	4	..	...	...	...	...	...	...	...	4	5	...	1	...	...
19	Golden gage	...	3	...	1	5	...	2	7	...	18	13	5	...	...	...
20	Alubukhara, large ...	...	1	...	...	...	...	...	5	...	6	1	5	...	...	...
21	Asperic	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...
22	Prune	...	1	...	3	8	...	7	2	1	21	15	6	...	...	...
23	Alubukhara, small ...	...	1	...	...	..	...	...	...	...	1	1	...	...	...	...
24	From 3 No. 2, Row No. 1...	...	...	...	1	4	...	...	...	...	5	4	1	...	...	...
25	Large yellow	...	1	...	...	...	...	...	...	...	1	...	1	...	...	...
26	Plum stocks	...	...	...	...	...	...	...	...	...	...	...	...	...	19	...
27	Plum without label ...	...	..	...	...	...	...	...	...	...	11	8	3	...	...	...
28	Plum stocks grafted and failed	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
	Total ...	36	24	2	33	43	1	19	22	11	191	176	26	11	19	2
	Peaches.															
1	Early River	...	...	7	3	9	...	...	1	...	20	18	2	...	...	...
2	Large Agra	...	2	...	...	4	...	...	...	...	6	7	...	1	...	...
3	Hardoi	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...
4	Violette Hative ...	3	...	...	1	...	...	1	...	...	5	4	1	...	...	...
5	Country No. 2 ...	...	2	...	...	...	...	...	...	...	2	3	...	1	...	...
6	Rhenny Shipstone ...	...	...	1	1	1	...	...	...	...	3	3	...	...	...	...
7	Dr. Hogg	...	...	2	...	3	...	...	...	...	5	5	...	.	...	...
8	Honey	...	...	1	...	4	...	...	...	...	5	6	...	1	...	...
9	China flat	...	1	...	...	...	...	...	...	...	1	1	...	...	..	...
10	Grosse Mignonne ...	3	...	...	...	...	...	...	...	...	3	3	...	...	...	...
11	Stirling castle	...	...	2	1	..	...	...	...	...	3	3	...	...	...	...
12	Anderson's Spring Hill ...	...	...	1	...	...	...	...	...	1	1	2	...	1	...	...
13	Early York	...	...	1	...	...	...	...	...	...	1	1	...	...	...	...
14	Prince of Wales ...	2	...	...	...	...	...	...	...	...	2	2	...	...	...	...
15	Belle Garde	2	...	...	...	...	...	...	...	...	2	2	..	...	...	...
16	Alexander Noblesse ...	2	...	...	...	...	...	...	...	...	2	4	...	2	...	...
17	Royal George	3	...	...	...	1	...	1	...	...	5	4	1	...	...	...
18	Peach, Madras	...	2	...	7	10	...	3	...	...	22	21	1	...	...	...
19	Crimson, Galande ...	2	...	...	3	3	...	...	...	1	8	8	...	...	...	...
20	Country No. 1... ...	...	2	...	..	2	...	...	1	...	5	3	2	...	...	...
21	Hakim	...	2	...	1	2	...	...	...	...	5	5	...	...	...	...
22	Country No. 3	...	2	...	...	2	...	...	...	...	4	3	1	...	...	...
23	Country No. 4	...	4	...	1	6	...	...	...	...	11	10	1	...	...	...
24	Peach stocks	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...
25	Without label	...	...	...	...	...	...	...	...	...	10	11	...	1	..	...
	Total ...	17	18	15	18	47	...	5	2	2	132	130	9	7	6	...
	Apricots.															
1	Hemskirk	4	2	...	...	...	...	...	...	...	6	7	...	1	...	...
2	Moore Park	4	3	3	1	3	...	...	...	...	14	16	...	2	...	...
3	Large, early	3	...	...	...	1	...	...	...	1	4	4	.	...	...	...
4	Cashmere	...	3	...	...	2	...	...	...	...	5	4	1	...	...	...
	Carried over ...	11	8	3	1	6	...	...	...	1	29	31	1	3	...	...

List of Fruit Trees in Orchard, 1898-99—continued.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From grafts, 1895.	From grafts, 1896.	From grafts, 1897.	From grafts, 1898.	Buds and grafts. Alive.	Buds and grafts. Dead.	Total of each.	Total, 1897.	Increase.	Decrease.	Stock.	Stocks grafted and failed.
	Apricots—concluded.															
	Brought forward ...	11	8	3	1	6	...	...	...	1	29	31	1	3	...	...
5	New, large, early	...	...	2	...	...	...	...	...	...	2	2	...	...	...	...
6	Royal	...	...	3	1	2	...	...	...	...	6	7	...	1	...	...
7	Brussels	...	...	2	1	...	...	...	...	...	3	3	...	...	...	...
8	Early orange	...	...	1	...	4	...	...	...	...	5	6	...	1	...	...
9	Frogmore	...	...	2	...	...	...	...	...	...	2	1	1	...	...	...
10	Golden drops	...	1	...	...	...	...	...	...	1	1	2	...	1	...	...
11	Mexican	...	2	...	...	...	...	...	...	...	2	2	...	...	...	...
12	Without label	...	...	...	...	...	...	...	...	...	10	11	...	1	...	...
	Total ...	11	11	13	3	12	...	...	...	2	60	65	2	7	...	...
	Nectarines.															
1	Claremont	...	3	...	4	15	...	1	...	...	23	24	...	1	...	...
2	Kabul	...	2	...	...	...	1	...	...	1	3	4	...	1	...	...
3	Murray	...	2	...	2	3	...	...	...	...	7	7	...	...	...	...
4	Peach	...	...	...	...	1	...	...	...	...	1	3	...	2	...	...
5	Elruge	2	...	...	...	...	...	...	...	...	2	2	...	...	...	...
6	Lord Napier	2	...	...	...	...	...	...	...	...	2	2	...	...	...	...
7	Pelmaston Orange	3	...		7	...	...	...	...	...	10	9	1	...	...	...
8	New, white	...	3	...	4	25	...	...	...	...	32	32	...	...	...	...
9	Hardwick's early	5	...	...	2	...	...	...	...	...	7	8	...	1	...	...
10	Without label	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...
	Total ...	12	10	...	19	44	1	1	...	1	89	93	1	5	...	...
	Cherries.															
1	May Duke	6	...	...	...	4	9	1	...	...	20	19	1	...	...	...
2	Begareau Napoleon	4	...	...	...	1	...	1	...	...	6	9	...	3	...	...
3	Warder's early black	8	...	...	3	2	7	3	1	...	24	16	8	...	...	...
4	Begareau	4	...	...	2	...	5	...	...	1	11	10	1	...	...	...
5	Kentish	7	...	...	3	12	2	6	1	...	31	25	6	...	...	...
6	Knight's early black	3	...	...	...	...	1	1	...	...	5	6	...	1	...	...
7	Florence	5	...	...	...	...	...	...	...	...	5	7	...	2	...	...
8	Morello	3	...	...	...	2	5	6	...	...	16	14	2	...	...	...
9	Elton	2	...	...	1	2	...	3	...	1	8	5	3	...	...	...
10	Almora No. 207	...	...	2	1	1	...	...	...	...	4	5	...	1	...	...
11	Without label	...	...	...	...	...	...	...	...	...	2	1	1	...	...	...
12	Stocks	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...
	Total ...	42	...	2	10	24	29	21	2	2	132	119	22	7	...	...
1	Quince	...	...	...	...	...	...	...	...	...	6	5	...	...	...	...
2	Mulberry	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...
3	Vacancies	...	...	...	...	...	...	...	...	...	65	132	...	...	...	...

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From cuttings.	Total of each.	Total, 1897.	Increase.	Decrease.	Dead.
	Vines.									
1	Black Hamburg	6	...	...	...	6	6	...	...	...
2	Miss Pearson	...	...	1	...	1	1	...	...	...
3	Gros Colmar	...	...	2	...	2	2	...	...	...
4	Muscat Alexendre	1	...	...	...	1	1	...	...	...
5	Trentham black	...	...	1	...	1	2	...	1	1
6	West St. Peter	...	...	1	...	1	2	...	1	1
	Total ...	7	...	5	...	12	14	...	2	2

List of Fruit Trees in Orchard, 1898-99—concluded.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From cuttings.	Total of each.	Total, 1897.	Increase.	Decrease.	Dead.
	Figs.									
1	Brown Turkey	5	...	...	14	19	22	...	3	..
2	Large Negro	2	...	...	4	6	6	...	...	...
	Total ...	7	...	...	18	25	28	...	3	...
	Currants.									
1	Red Dutch	1	...	...	...	1	8	...	7	7
	Total ...	1	...	...	...	1	8	...	7	7
	Nut.									
1	Walnuts	...	...	...	...	18*	21	...	3	3
2	Cobnuts	...	...	...	...	1	1	...	...	...
3	Filberts	1	...	...	...	1	6	...	5	5
	Total ...	1	...	...	...	20	28	...	8	8

STATEMENT No. III.—*Description of seeds received, together with the cost of consignment and of distribution during the year 1898-99.*

Seeds.		From	Date of receipt.	Cost of consignment.	Cost of distribution.	Remarks.
Description.	Quantity.			Rs. A. P.	Rs. A. P.	
Havana and Virginia tobacco.	24 lbs.	D. Landreth and Sons, Philadelphia, United States of America.	13th May 1898	264 13 6	10 8 0	
English vegetable seeds.	68 lbs.	England, Sutton and Sons. Through Secretary, Agri-Horticultural Society, Burma.	29th August 1898.	392 11 10	...	
Eucalyptus seeds.	Twenty packets of ten varieties.	Secretary, Agri-Horticutural Society, Burma.	22nd July 1898	12 0 0	...	
Tree tomato seeds (Cyphomandra betacea).	One packet to produce about 3,000 plants.	Superintendent, Botanical Gardens, Hakgala.	16th August 1898.	...	...	Free.
		Total ...		669 9 4	10 8 0	

STATEMENT No. IV.—*Distribution list of seed obtained for experimental cultivation during the year 1898-99.*

No.	How distributed.		Tobacco.		English vegetable seeds.		Eucalyptus seeds.		Tree tomato seeds (Cyphomandra betacea).		Remarks.
	District.	Designation or name of officer receiving seed.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	
1	2	3	4	5	6	7	8	9	10	11	12
			lbs.		lbs.		lbs.		lbs.		
	LOWER BURMA.										
1	Hanthawaddy	Deputy Commissioner ...	1	15th July 1898	...	.....	...	.....	...	.....	
2	Tharrawaddy...	ditto ...	1	15th July 1898	...	.....	...	.....	...	.....	
3	Bassein ...	ditto ...	1	15th July 1898	...	.....	...	.....	...	.....	
4	Myaungmya ...	ditto ...	1	15th July 1898	...	.....	...	.....	...	.....	
5	Amherst ...	ditto ...	1	15th July 1898	...	.....	...	.....	...	.....	
6	Amherst, Moulmein.	Secretary, Agri-Horticultural Society.	1	15th July 1898	...	.....	...	.....	...	.....	
7	Thatôn ...	Deputy Commissioner ...	1	15th July 1898	...	.....	...	.....	...	.....	
8	Tavoy ...	ditto ...	½	15th July 1898	...	.....	...	.....	...	.....	
9	Mergui ...	ditto ...	1	15th July 1898	...	.....	...	.....	...	.....	
10	Salween ...	ditto ...	1	15th July 1898	...	.....	...	.....	...	.....	
11	Thayetmyo ...	ditto ...	½	15th July 1898	...	.....	...	.....	...	.....	
	UPPER BURMA.										
12	Mandalay ...	Deputy Commissioner ...	3	15th July 1898	4	15th Sept. 1898	...	.....	...	.....	
13	Katha ...	ditto ...	...	.....	8	15th Sept. 1898	*	29th July 1898	†	19th Aug. 1898	* Twenty packets of ten varieties.
14	Ruby Mines ...	ditto ...	...	.....	4	15th Sept. 1898	...	.....	...	.....	† One packet to produce about 3,000 plants.
15	Bhamo ...	ditto ...	...	.....	4	15th Sept. 1898	...	.....	...	.....	
16	Myitkyina ...	ditto ...	½	15th July 1898	8	15th Sept. 1898	...	.....	...	.....	
17	Sagaing ...	ditto ...	2	15th July 1898	4	15th Sept. 1898	...	.....	...	.....	
18	Shwebo ...	ditto ...	1	15th July 1898	4	15th Sept. 1898	...	.....	...	.....	
19	Lower Chindwin	ditto ...	1	15th July 1898	4	15th Sept. 1898	...	.....	...	.....	
20	Upper Chindwin	ditto ...	1	15th July 1898	8	15th Sept. 1898	...	.....	...	.....	
21	Meiktila ...	ditto ...	1	15th July 1898	...	.....	...	.....	...	.....	
22	Meiktila ...	Commissioner ...	...	.....	4	15th Sept. 1898	...	.....	...	.....	
23	Yamèthin ...	Deputy Commissioner ...	...	.....	...	.....	...	.....	...	.....	
24	Myingyan ...	ditto ...	½	15th July 1898	4	15th Sept. 1898	...	.....	...	.....	
25	Minbu ...	ditto ...	1	15th July 1898	...	.....	...	.....	...	.....	
26	Magwe ...	ditto ...	1	15th July 1898	...	.....	...	.....	...	.....	
27	Pakôkku ...	ditto ...	2	15th July 1898	4	15th Sept. 1898	...	.....	...	.....	
28	Chin Hills, Falam.	Political Officer ...	...	.....	8	15th Sept. 1898	...	.....	...	.....	
		Total ...	24	.....	68	.....	*	.....	†	.....	

STATEMENT No. V.—*Experimental cultivation—Tobacco.*

No.	District.	Particulars regarding experiment.	Result of experiment.
			LOWER BURMA.
1	Hanthawaddy	Distributed to the Subdivisional Officer, Insein.	Failure. Owing to the absence and illness of his head clerk all trace of the seed was lost and none was distributed for experiment.
2	Tharrawaddy	Distributed to *ywathugyis* and Township Officers.	Failure. In most cases the seeds have not even germinated, and in others the young plants died.
3	Bassein ...	Distributed to cultivators through the Subdivisional Officer, Ngathainggyaung.	Failure. The cultivators did not take sufficient care, and the plants were destroyed by vermin.
4	Myaungmya	Distributed to the Subdivisional Officer, Myaungmya.	Failure. Owing to want of rain.
5	Amherst ...	Grown on alluvial land. Planted in October.	The experiment was made at Kado, and proved a success. Sample of leaves was sent for inspection.
6	Amherst (Moulmein).	Secretary, Agri-Horticultural Society.	Forty-five packets of seeds were distributed to Shans and other cultivators in the Mainmahla-kyun, but the experiment failed in most cases. A sample of the leaves grown in Victoria Gardens by the Society was forwarded for inspection.
7	Thatôn ...	Distributed to Thugyis and Township Officers.	Failure, except at Bilin, where experiment was fairly successful. The failure is attributed to unsuitable soil.
8	Tavoy ...	Distributed to Thugyis and *ywathugyis*, through Township Officers.	The experiment was like last year successful in the Northern and South-eastern townships, and failed in the other two townships. The failure is ascribed in one case to want of dew and in the other to heavy rainfall. Sample of leaves from the Northern township was forwarded for inspection.
9	Mergui ...	Distributed to the Subdivisional Officer, Maliwun and the Township Officer, Tenasserim.	The results of the experiments were favourable.
10	Salween ...	.....	Report not received.
11	Thayetmyo ...	Distributed to the Subdivisional Officers, Myedè and Thayetmyo.	The experiment failed in Myedè for want of rain. In Thayetmyo it proved successful and produced about 40 viss of tobacco, but the cultivators did not appreciate it.
			UPPER BURMA.
12	Mandalay ...	.....	Failure. No reasons were given.
13	Myitkyina ...	Grown on alluvial land, not manured or irrigated. Planted in October.	The experiment was successful, and produced 100 viss of tobacco.
14	Sagaing ...	Distributed to Township Officers.	The experiments proved a failure in every case, owing to want of rain.
15	Shwebo ...	Distributed to the Subdivisional Officers, Ye-u and Shwebo.	The experiments were successful in Ettaw and Myaukzeywa villages in the Ye-u township, but failed elsewhere.
16	Lower Chindwin.	Distributed to cultivators through Township Officers.	The experiments were made in nine villages. In two villages the experiment was fairly successful; but in the others it proved a total failure, owing to want of rain and poverty of the soil.
17	Upper Chindwin.	Grown on alluvial land, not manured or irrigated. Planted in September.	The experiment was successful and produced 91 lbs. of tobacco. As the cultivation is appreciated by the Burmese the Deputy Commissioner has asked to be supplied with a larger quantity of tobacco seeds for cultivation during the next season.
18	Meiktila ...	.....	Failed, except in Myin-u-hle, where the experiment was a partial success. The failure is ascribed to want of rain.
19	Myingyan ...	Grown on sandy soil. Planted in December and January.	Seeds did not germinate in most cases, and in others the plants died off when still young.
20	Minbu ...	Distributed to Subdivisional Officers.	Failed, except at Thangaing, where the experiment was fairly successful.
21	Magwe ...	Distributed to the Township Officers, Taungdwingyi and Myingun.	Failure.
22	Pakôkku ...	Distributed to the Township Officers, Pakôkku and Yesagyo.	In most cases the seeds have not even germinated. Sample of leaves grown in the villages of Kyunbulu, Ngalan, Ngamya, and Kyunpyut by thugyis were forwarded for inspection.

STATEMENT NO. VI.—*Experimental cultivation—English vegetable seeds.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA.	
1	Mandalay ...	Distributed to the Taungbaing and Myaukbaing thugyis.	The experiment proved a success.
2	Katha ...	.....	The experiment has proved successful, except in the case of asparagus and broccoli.
3	Ruby Mines	.....	The experiment was tried in the Deputy Commissioner's and the Subdivisional Officer's gardens. The Deputy Commissioner reports that as English vegetables grow well in Mogôk, and as such vegetables are extensively cultivated for the consumption of Chinamen and others, the supply of seeds by Government is no longer necessary.
4	Bhamo ...	.....	The seeds germinated freely and the crop was a good one.
5	Myitkyina ...	.....	In Myitkyina the experiment proved a failure, owing to heavy rains. In Mogaung and Sima it was a great success, while in Sadon it was successful also, except in respect to tomatoes, radish and onions.
6	Sagaing ...	.....	In Sagaing, knolkhol, beans, and radish turned out well; other seeds failed. In Myotha the experiment proved a failure as the soil is not suitable for these seeds.
7	Shwebo ...	.....	In Malè, cabbage, cauliflower, carrots, tomatoes, beans, and knolkhol were fairly successful. In Myedu and Indaing the experiments failed, as the seeds were destroyed by insects.
			In Ye-u the experiment proved successful, except as regards peas, carrots and turnips. In Magyidaw, the experimental cultivation of onion, which was made on "Tanè" soil, manured with sessamum refuse and watered once in ten days, proved a great success, and produced about 17,500 pounds of onions.
8	Lower Chindwin.	Distributed to Subdivisional and Township Officers.	Most of the experiments failed owing to untimely rainfall. In some cases the plants grew up, but were destroyed by insects. As the experimental cultivation of English vegetable and tobacco seeds has repeatedly failed the Deputy Commissioner considers that it is not desirable to continue the experiments any longer in his district.
9	Upper Chindwin.	Grown on sandy soil. Planted in October.	The experiment was a partial success.
10	Meiktila ...	Grown on alluvial land manured with the ashes of cow-dung and watered by a small channel from Meiktila tank.	The experiment proved successful, but the seeds planted in October were more healthy than those sown in January and February.
11	Myingyan ...	Grown in the Jail garden.	The experiment proved fairly successful.
12	Pakôkku ...	Distributed to the Subdivisional Officers, Pauk and Pakôkku, and the Superintendent of Jail, Pakôkku.	The experiments tried by the Subdivisional Officer, Pauk, and the Superintendent of Jail, Pakôkku, in their respective gardens, proved a great success, except broccoli and asparagus, which do not appear to grow well in those parts. The experiment tried by the Subdivisional Officer, Pakôkku, proved a failure, as the officer took no interest in the experiment.
13	Chin Hills (Falam).	.....	The experiment proved successful, except as regards cauliflower and onion, which do not turn out well.

STATEMENT NO. VII.—*Experimental cultivation—Eucalyptus seeds.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA.	
1	Katha ...	.....	The seed failed to germinate in Katha; but the experiment tried by Mr. Wakley, at Banmauk, proved a success, and 58 young plants are now growing up. The failure is attributed to the sowing of the seed in the rains.

STATEMENT No. VIII.—*Experimental cultivation—Tree tomato seeds, (Cyphomandra betacea).*

No.	District.	Particulars regarding experiment.	Result of experiment.
		UPPER BURMA.	
1	Katha ...	.....	The seeds sent are reported not to have been those of the tree tomato, but of some large kind of the common tomato. Three tree tomatoes, grown from the seed supplied the year before last, are stated to be now fruiting in the Deputy Commissioner's garden, but have unfortunately been blown down by a hail storm. An annual supply of the seed is asked for as the soil is said to be suitable for the cultivation of the plant.

G. B. C. P. O.—No. 10147, D., L. R. & A., 24-8-99—244.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

FOR THE YEAR 1899-1900.

RANGOON: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, BURMA. NOVEMBER 1900.

[Price,—Re. 1-0-0 = 1s. 6d.]

TABLE OF CONTENTS.

REPORT ON THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BURMA, FOR THE YEAR 1899-1900.

SECTION I.

Prefatory.

	Para.	Page.
Officers who held charge of the department ...	1	1
Inspection work done ...	2	2

SECTION II.

Land Records Establishments.

Introduction of new establishments during year ...	3	2

SECTION III.

Utilisation of Land Records.

Remarks on Township books and statistics ...	4	2

SECTION IV.

Scientific and national enquiry under Imperial control.

Reports published annually ...	5	2
Collections sent to Reporter on Economic Products ...	6	3
Tea in the Myitkyina district ...	7	4

SECTION V.

Scientific and local enquiry under Provincial control.

Experimental gardens ...	8	4
Experiment in growing wheat at Kôngtûng, Southern Shan States ...	9	5
Tobacco cultivation ...	10	ib.
English vegetable seeds ...	11	6
Ground-nut experimental cultivation ...	12	ib.
Wheat (from Sagaing) ...	13	ib.
Distribution of paddy ...	14	ib.
Sugarcane cuttings ...	15	7
Outturn of potatoes from seed ...	16	ib.
Experiments with eucalyptus seeds ...	17	ib.
Pithecolabium saman ...	18	ib.
Cyphomandra betacea ...	19	ib.
Agricultural implements ...	20	ib.
Experiments with basic slag as manure ...	21	ib.

SECTION VI.

Agricultural Education.

Remarks on agricultural progress in Southern Shan States ...	22	7

SECTION VII.

Amendment of the Burma Famine Code ...	23	8
Forecast of the rice crop ...	24	ib.

APPENDICES.

	Page.
Report on the experimental orchard at Sinlum for the year 1899-1900 ...	v.
Statement A.—Actual total receipts and disbursements from 1st June 1899 to 31st May 1900 (year under report) ...	vii.
Statement B.—Details of disbursements from 1st June 1899 to 31st May 1900 ...	ib.
Report on experimental cultivation in the Chin Hills for the year 1899-1900 ...	ib.
Statement A.—Actual total receipts and disbursements from 1st April 1899 to 31st March 1900 ...	x.
Statement B.—Details of disbursements from 1st April 1899 to 31st March 1900 ...	ib.
Statement C.—List of fruit trees ...	ib.
Statement showing rainfall at Falam, Tiddim, and Haka for the year 1899-1900 ...	ib.
Report on experimental cultivation in the Southern Shan States for the year 1899-1900 ...	xi.
Statement A.—Actual total receipts and disbursements from the 1st June 1899 to 31st May 1900 (year under report) ...	xvii.
Statement B.—Details of disbursement from the 1st June 1899 to 31st May 1900 ...	ib.
List of roses ...	xviii.
List of fruit trees in orchard, 1899-1900 ...	xix.

APPENDIX II.

Statement No. I.—Description of seeds received, together with the cost of consignment and of distribution during the year 1899-1900 ...	xxiv.
Statement No. II.—Distribution list of seeds obtained for experimental cultivation during the year 1899-1900 ...	xxv.
Statement No. III.—Experimental cultivation—Tobacco seed ...	xxvi.
Statement No. IV.—Result of English vegetable seed experiments ...	xxvii.
Statement No. V.—Experimental cultivation—Ground-nut ...	ib.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

FOR THE YEAR 1899-1900.

SECTION I.

PREFATORY.

MR. H. THOMPSON, C.S., held temporary charge of the office of Director until the arrival of Mr. A. Gaitskell, C.S., on the 1st May 1899. Mr. Gaitskell was in charge during the rest of the year.

Mr. J. C. Clancey, F.R.A.S., held charge of the post of Assistant to the Director of Land Records and Agriculture throughout the year. He was on privilege leave from the 15th March to the end of the year.

Two Survey of India Officers, Mr. A. L. George and Mr. W. J. Baker, were appointed to the department as Superintendents, 4th grade, on Rs. 450 per mensem and 5th grade on Rs. 300 respectively. One probationer, Mr. H. R. K. Littlewood, was appointed to the charge of the Supplementary Survey in Rangoon Town on Rs. 100 per mensem, with a local allowance of Rs. 50. Maung Ba Kyaw, who was officiating as Senior Inspector, was appointed to a Myoôkship, and has left the department. Mr. C. G. S. Wood, on his return from furlough, assumed charge of the Land Records work in the Shwebo district on the 17th March 1900. Mr. J. Haddock, F.R.G.S., was on privilege leave from 7th September 1899 for three months. During his absence Mr. H. B. Powell, Registrar of Town Lots, Mandalay, carried on his work. Mr. C. R. Ellis, a Township Officer, was in temporary charge of Mr. Powell's duties.

The following transfers and postings were made during the year:—

Mr. A. L. George posted to Meiktila. Mr. W. J. Baker posted to Prome. Mr. L. E. Palmer, transferred from Prome to Myingyan. Mr. J. P. Connor put in charge of the Land Records work, Katha. Mr. Ripley put in charge of the Land Records work, Shwebo, until the arrival of Mr. Wood, when he was transferred to Yamèthin.

The following promotions were sanctioned:—

Maung Tha Do Pru, from Superintendent, 5th grade, to Superintendent, 4th grade.

Maung Ba On, from Superintendent, 6th grade, to Superintendent, 5th grade.

Maung Do Kaing, from Probationer to Superintendent, 7th grade.

Mr. E. Bell, from Probationer to Superintendent, 7th grade.

Mr. N. W. Purchase, from Probationer to Superintendent, 7th grade.

Mr. C. Godfrey, from Probationer to Superintendent, 7th grade.

Mr. D. O'Hara, from Probationer to Superintendent, 7th grade.

Mr. L. Aubert, from Senior Inspector to Superintendent, 7th grade.

Mr. R. S. Carrapiett, from Probationer to Officiating Superintendent, 7th grade.

Mr. H. C. Rees, from Apprentice to Probationer.
Mr. J. P. Connor, from Apprentice to Probationer.
Mr. W. F. Ripley, from Apprentice to Probationer.

2. During the year the Director inspected the office work of the Pegu and Hanthawaddy revision settlements, and, on the arrival of Mr. T. C. Wilson, C.S., from furlough on the 8th January, all settlement work was handed over to him as Settlement Commissioner. With the exception of Thôngwa and Sandoway in Lower Burma and Minbu in Upper Burma, all districts under supplementary survey were visited by the Director or Assistant Director, and the field and office work, together with survey schools, inspected. The office work only was inspected in Thôngwa, Shwebo, Katha, and Myingyan districts, in which a summary assessment was being carried on, were transferred to the charge of the Settlement Commissioner. Revision surveys were being carried on in three districts, and special surveys of fresh lands newly brought under cultivation in two districts. All these surveys were inspected during the year.

SECTION II.

LAND RECORDS ESTABLISHMENTS.

3. New establishments were introduced during the year in the districts of Myingyan, Yamèthin, and Shwebo, and in the Nyaunglebin subdivision of Pegu. The staff of Superintendents and probationers was brought up to its full numerical strength. All the probationers and even the Senior Inspector had to be put in independent district charges. Since the scheme for the reorganization of the department has been sanctioned, it will be possible to keep the probationers under training for some time before they are allowed independent charge. This year the Land Records staff will be utilized for census operations. No change has been made in the qualifications required for the subordinate posts.

SECTION III.

UTILIZATION OF LAND RECORDS.

4. The township books are now regularly kept up for each township, and remarks explaining increases or decreases entered by the Superintendent of Land Records. They have been in use too short a time for actual demonstration of the progress or decline of agriculture in any particular village.

Besides forming a basis of assessment, the Land Records also furnish an accurate account of the area under each crop, of sales and mortgages, rents and prices, and of all extensions of cultivation.

The statistics collected are used by the Revision Settlement Officer as an indication of the condition of agriculture, and as an assistance in fixing the new rates of assessment.

The maps also show all grazing grounds and fisheries and the boundaries of the village headmen's jurisdictions, and maps are also supplied by the Land Records Department showing the topographical features of each district, district divisions, thana charges, etc.

SECTION IV.

SCIENTIFIC AND NATIONAL ENQUIRY UNDER IMPERIAL CONTROL.

5. Separate reports are published annually on the following subjects :—

(1) Rainfall.
(2) The Civil Veterinary Department.
(3) The frontier trade between Burma and adjacent states.
(4) Crop measurement statistics.
(5) Statistics of sales mortgages and rents, together with areas under the various crops and prices in each circle of the districts under supplementary survey.

6. The statement below gives the list of economic products collected for the Reporter on Economic Products during the year.

Economic Products sent for the Indian Museum, Calcutta, and Imperial Institute, London.

Name.	Description of specimen sent.	From where obtained.
Alum	Lumps of salt	Found in the Kyaukchin *chaung* (Alum stream) Shwegyin, subdivision, Toungoo, and in Mandalay district.
Anogeissus, acuminata (combretacea).	Two dried leaves	Mandalay forest circle.
Andropogan Sorghum ...	Grain, spikes and botanical specimens.	Meiktila, Myingyan, Lower Chindwin, and Pakôkku.
Alcurites Moluccana	Oil in bottles, twigs leaves and nuts	Mergui, Tavoy. Forest circle, Central division of the Southern Shan States and Karenni.
Arsenic	Chief forms met with in the bazaars.	Mandalay.
Bouea, Burmanica, Mericu m or Mayan.	Fruit, ripe, salted, and preserved in spirits, and plant.	Hanthawaddy, Pegu, Amherst, and Mandalay.
Cements (4th resinous) ...	Gum, resin, and botanical specimens.	Prome and Thayetmyo.
Cornelian (1st rock crystal) ...	Quartz, ore	Tavoy, Mergui, Mandalay, and Ruby Mines.
Coix lachryma jobi	Plants, roots, seeds, and fruits of edible, non-edible, and odorous varieties.	Tharrawaddy, Pegu, Prome, Amherst, Tavoy, Thatôn, Akyab, Mandalay, Katha, and Southern Shan States.
Cynometra, ramiflora (Myinkabin)	Wood, bark, roots, leaves, fruits, and seeds.	Thatôn and Mergui.
Deer, barking	Skins	Hanthawaddy, Thôngwa, and Myaungmya.
Deer, sambur	do	Pegu and Thatôn.
Deer, hog (axis procinus) ...	do	Myaungmya.
Dioscorea (yams)	Tubers, live tubers, botanical specimens of wild, cultivated, indigenous or exotic, in various forms.	Hanthawaddy, Prome, Tharrawaddy, Akyab, Amherst, Salween, Thatôn, Toungoo, Tavoy, Myaungmya, Thayetmyo, Mandalay, Bhamo, Katha, Ruby Mines, Shwebo, Lower Chindwin, Meiktila, Myingyan, Minbu, Karenni, Southern Shan States.
Lac and lac manufactures ...	Specimens of Burmese lacquerware.	Prome and Myingyan.
Oryza, sativa (wild variety) ...	Grain and plants	Thatôn.
Oryza, coarctata	do	Amherst and Pegu.
Sideroxlon, grandifolium, wall, tut-ta-bat.	Fruits, branches, and leaves ...	Twantè, Hanthawaddy district.
Zanthoxylum, Budrunga, Mayanin	Fruit, leaves, and bark ...	Arakan division, Tenasserim forest circle.

I regret to say that some of the specimens were spoilt on the journey across to Calcutta, and in each case the damage was attributed to defective packing. One valuable collection of Burmese lacquerware from Myingyan which arrived from Myingyan at Rangoon, intact suffered very severely in this way on the voyage to Calcutta.

My thanks are especially due to the Conservator of Forests, the Superintendent, Southern Shan States, and the Deputy Commissioners of the Lower Chindwin, Myingyan, Prome, and Mergui districts, for the interest and trouble they have taken in making these collections.

The Reporter on Economic Products, Dr. Geo. Watt, C.I.E., paid Burma a short visit for the first time in December. He was enabled to visit the chief industrial centres and also to meet and explain to the local Chamber of Commerce the objects and advantages sought for by the establishment of the Indian Museum, Calcutta. Dr. Watt also supplied valuable information on the remedy for a certain kind of fungus (*sphacelia oryzae*) which had appeared on ears of paddy in Akyab and Tharrawaddy.

Tea in the Myitkyina district.

7. The Deputy Commissioner, Myitkyina, supplied a note concerning the tea grown by Kachins in the Myitkyina subdivision. It was drawn up by the Subdivisional Officer. The note contributes but little more information than is already embodied in Agricultural Ledger No. 27 of 1896, published by the Reporter on Economic Products. Its substance is as follows.

"Tea is grown in three hills, Mangin, Watu, and Panle in the Sinlu circle. The seeds are dried and stored in September, and after the jungle has been cleared, are sown in nurseries in May. Holes are drilled about 4 feet from one another and two or three seeds on germinating are dropped into each hole. Germination is said to take about one month. The plantation is carefully weeded and, after a lapse of three years, in the month of April the tender leaves are plucked. The leaves are either boiled or steamed. Steaming is only practised by those who have the necessary steaming pots, called in Burmese *paung gyaung*. After the above process, which softens and imparts a yellow tint to the leaf, the leaves are taken out and spread on a mat for a night; next morning they are put into bamboo tubes or in baskets lined with green leaves. The above tea is known as pickled or wet tea and is sold at Rs. 2 per 10 viss. If the tea leaves are not sufficiently softened by boiling or steaming, they are rolled by hand on a mat before being put in the basket.

"To make dry tea, the leaves, after being boiled or steamed, are pounded tight into a green bamboo tube. The thickness of the latter is then reduced as nicely as possible, and the tube is kept over a slow fire. Dried tea sells at Re. 1 per four tubes, each weighing from 20 to 25 tickals."

The Deputy Commissioner, Myitkyina, estimates that 300 to 400 square miles are available for tea cultivation in his district.

SECTION V.

SCIENTIFIC AND LOCAL ENQUIRY UNDER PROVINCIAL CONTROL.

Experimental gardens.

8. Reports were received from the experimental gardens at Taunggyi in the Southern Shan States, at Sinlumkaba in Bhamo, at Sadôn and Sima in Myitkyina, and at Falam in the Chin Hills. The reports are printed in full in Appendix I, with exception of that on the gardens in Myitkyina. In these two gardens little but English vegetables have been grown, but experiments are now being made with apple, pears, peach, plum, and apricot trees. Strawberries have also done well.

The Deputy Commissioner points out that an orchard at Myitkyina would probably be in a few years self-supporting. Myitkyina is within 30 hours of Mandalay and 48 hours of Rangoon by rail, and it would be possible to supply both markets with English fruit.

Bhamo.—The orchard at Sinlumkaba has made a good start. Most of the young fruit trees are thriving. Lichees have failed and filbert and cobnut, gooseberry and currant trees do not promise very well.

The Deputy Commissioner wishes to devote more attention to those fruit trees that will not grow in the plains and whose fruit will bear the risk of transport to market. At Bhamo, Myitkyina, and Katha peach trees have yielded an abundance of fruit in private gardens, and there is no doubt that they grow in those districts equally well in the plains as on the hills.

Chin Hills.—The Government grant was only made for the orchard and garden at Falam, but half of the fruit trees obtained were planted at Haka and Tiddim. At these two posts there is no gardener, and most of the fruit trees have perished. At Falam three-quarters of the trees planted still survive. Strawberries and English vegetables, except broccoli, do very well. The Chin Hills are at present out of the reach of any large market, and it would be useless to grow more fruit and vegetables than are needed for the European population in the Hills. Even potatoes are said not to be relished by the Chins and are grown solely for sale to Europeans.

Southern Shan States.—The report on the Experimental garden at Taunggyi is not published this year separately. Experiments in wheat cultivation are no longer

carried on, as the Shans are fully alive to its importance, and are able to grow wheat without further encouragement in the Myelat. The vegetable garden was washed away by two floods in October and November, and consequently the receipts from the sale of vegetables have diminished from Rs. 216 last year to Rs. 128-12-0 this year. The dry-weather crop of potatoes was fairly good, but the wet-weather crop was a failure. Potato-growing by Shans is not expected to progress until some facilities are afforded for reaching the Burma market. In the orchard strawberries have done well, and there was a good crop of peaches, but unfortunately much of the fruit was ruined by cockchafers. The nectarine trees have yielded an abundance of fruit. The Superintendent has now proved satisfactorily that the *Docinia Indica* is suitable for grafting European apple trees on. The total expenditure on the garden and orchard was Rs. 3,844 and the receipts obtained by the sale of the produce amount to Rs. 1,778.

9. *Experiment in growing wheat at Kēngtūng, Southern Shan States.*—Owing partly to the ignorance of the cultivators and partly to an unfavourable season the experiment made in growing wheat in 1898-99 showed that, with careful cultivation, wheat could be grown there, but financially the results were not satisfactory. This year 5,000 lbs. of seed wheat were procured from the North-Western Provinces and despatched to Kēngtūng. A Burman who had experience in wheat-growing in the Yawhngwè State took the wheat-seed with him to Kēngtūng and arrived there on the 12th September. The land was prepared in June, July or August, and the wheat-seed distributed as an agricultural advance to cultivators at the end of September. The first sowing commenced on the 10th October and the second sowing on low, damp soil on the 27th October. One hundred and eighty-six plots were planted with wheat. On the 26th December and following days the Assistant Political Officer, Captain G. Drage, visited 47 plots. He found that the high-lying land was in want of water, and the low-lying soils were covered with thick, coarse weed, and were getting too much water. He found that the Burman in charge had been apathetic, and he did his best to have the weeds cleared and the water-supply regulated. Too many seeds had been put into each hole, the lines were not straight, and the surface soil had been powdered too finely. The total yield was 15,446 lbs. and 2,500 lbs. are estimated to have been destroyed by elephants and cattle. The improvement in the yield is put down to the efforts of the Burman in charge. The failures were due chiefly to the laziness of the cultivators. The best yield from one plot was 322 lbs. from 8·17 lbs. sown, and the largest total yield from one plot was 1,305 lbs. from 56·24 lbs. of seed. This last plot was on rich, alluvial soil. Maung Tun Maung took care that the wheat was properly sifted and cleaned. None of it was rejected by the Commissariat. Out of the total obtained 3,500 lbs. were retained for seed-wheat and the rest sold to the Commissariat at Rs. 15 per 100 lbs. The cultivators were paid for the wheat at the rate of Rs. 6 per 100 lbs. A separate sum of Rs. 239-5-3 was incurred in the cost of supervision apart from the cost of the wheat.

The summary of receipts and disbursements are given below :—

Receipts.	Amount.	Disbursements.	Amount.
	Rs. A. P.		Rs. A. P.
11,929 lbs. sold to the Commissariat department at Rs. 15 per 100 lbs.	1,789 5 7	Cost of purchase and transport to Kēngtūng of seed-wheat.	1,267 3 9
3,517 lbs. of seed-wheat in hand at Rs. 15 per 100 lbs.	527 8 7	Paid to cultivators for 15,446 lbs. of wheat at Rs. 6 per 100 lbs.	926 12 0
Total ...	2,316 14 2	Total ...	2,193 15 9

The cultivators were thus fully paid for the wheat they delivered and a book profit of Rs. 122-14-5 was obtained or about 10 per cent. on the cost of the delivery of the wheat to the cultivators.

DISTRIBUTION OF SEED.

10. *Tobacco.*—The results of the experiments made are given in the Appendix II, Statement No. III. The only districts in which sucessful results were obtained

are Thôngwa (Danubyu and Yandoon townships) and Thatôn (Kyaikto and Bilin townships). In Myitkyina a moderate success was obtained in the riverine tract, and in Amherst, Tavoy, Myaungmya, Minbu, and Shwebo fair results were obtained in one or two cases; elsewhere the experiments failed. In Thôngwa only some care seems to have been taken in gathering and curing.

(APPENDIX II, STATEMENT IV.)

11. *English Vegetable seeds.*—In Pakôkku the experiments were carried out by the District Officers and by the Assistant Conservator of Forests and were fairly successful, especially with radish, lettuce, carrots, and peas. In Mandalay the rain in November washed all the plants out. In Bhamo ants destroyed the carrots and turnips in Shwegu, while in Bhamo town a blight attacked the tomatoes. In Myitkyina the vegetables were grown in the Sadôn garden; cabbage, broccoli, khol rabi, and beet did not get enough water, and the turnips were eaten by insects. In the Sima garden most of the vegetables did well, but were not so good as last year owing to heavy rain. Turnips, tomatoes, celery, parsley, and French beans sown in April were good in spite of the warm weather; beans, lettuce, parsley, khol rabi, and tomatoes grown during the rainy season did fairly well. In Katha the experiments conducted by the Burmans gave little or no results, turnips and peas were fairly successful, while asparagus did well in the jail garden. In Sagaing and Shwebo, where there should be little reason for failure, the experiments were not successful, due to the general indifference shown regarding them, and also to the heavy rainfall in Sagaing in November.

In the Upper Chindwin the vegetables proved a success and were useful, and partially failed only in the Kindat and Mingin townships; in the latter case due to heavy rains. In Meiktila the experiments were only a moderate success. They were grown by Chinamen. In Myingyan the vegetables were planted by a Burman, and due care is said to have been given to them but without success. In the Chin Hills at Falam no record of the early sowings were kept owing to officers being absent on column duty, but the seeds appear to have given good results. Vegetable seeds were also sent to the Superintendent of the Northern Shan States. The sowings made during the rains are reported to have failed owing to heavy rain and want of sunshine. In the dry weather the vegetables, with the exception of three, asparagus, onions, and parsnips, did well. The Shan cultivators were successful with English tomatoes, and it is said that if seed were imported in large quantities the indigenous variety would be neglected in their favour. The garden at Lashio is some distance from wells and all the water has to be carried up. Red, white, and black ants also gave much trouble and no means was found of getting rid of them. If the ground is constantly being dug up, however, it is probable that the ants will cease their attacks.

(APPENDIX II, STATEMENT V.)

12. *Ground-nut.*—The experiments appear to have failed in the majority of cases from the seeds being sown late in September instead of in August, and in other cases owing to heavy rain. In Thayetmyo the seeds were sown in September and a successful crop obtained at one village. In Bhamo the seeds were sown in June and one good result obtained. In Shwebo the one crop that succeeded was sown in September while in Myingyan a successful result was obtained from seed sown in June.

13. *Wheat (from Sagaing).*—Ten baskets of seed were given to a cultivator in Amherst, but the seeds were asked for very late in the year, and only a little of the seed was sown. A further trial is to be made this year.

Fifteen baskets of seed were sown by cultivators on 15 acres in Shwebo, but the experiment failed owing, it is said, to want of rain and to the climate and locality being unsuitable.

14. *Paddy.*—Seventy-two baskets of paddy from Lower Burma were distributed to cultivators in the Indaw, Wuntho, and Kawlin townships of Katha. There was an exceptionally heavy rainfall, and, though the plants grew well, the ears failed to fill.

15. *Sugarcane.*—In Minbu (Upper Burma) twenty cuttings of sugarcane were sent in July at the request of the Deputy Commissioner, but failed to grow as the time of year was unsuitable. Five hundred sugarcane tops sent in January are reported to be doing well.

Five thousand sugarcane tops were procured from Thatôn and sent to Sandoway. The experiment failed. The cultivators allege that the end of the rains is a bad season for transporting sugarcane tops, but this is not a satisfactory explanation.

16. *Potatoes.*—In the Upper Chindwin experiments were made with 100 viss of potatoes. The majority failed, but in one instance 56 lbs. of seed gave an outturn of 400 lbs.

17. *Eucalyptus.*—Seeds were supplied to the Deputy Commissioners of Katha and Pakôkku. In Katha the seeds did not germinate and those few that did are reported to be of the *datura* plant. The seed was only sent to Pakôkku in December so no report has yet been made.

18. *Pithecolabium sanum.*—Seeds of the rain tree were sent to the Deputy Commissioner, Meiktila, and sown at Thazi, but, owing to the transfer of officers, the nursery did not receive proper attention.

19. *Cyphomandra betacea.*—Seeds of the tree-tomato were supplied to the Deputy Commissioners of Bhamo, Myitkyina, and Katha. The seeds are said to have been old and failed to germinate.

20. *Agricultural implements.*—No experiments were made with new agricultural implements during the year. The Sultan water-lift is in the custody of the Deputy Commissioner, Minbu, but, owing to the illness of the District Overseer it has not been looked after and some of its parts were reported to be missing. They have now been found and a further trial will be made this year.

21. *Manures.*—Through the courtesy of the Trading Corporation (late Messrs. Hegt and Company), experiments were made with basic slag. Five bags each were supplied to the Deputy Commissioner, Myingyan, to the Superintendent, Southern Shan States, and the Deputy Commissioner, Bassein. In Myingyan the experiment was made on cotton-growing land. Owing, however, to the unfavourable nature of the season and the late period at which it was laid down no conclusions could be drawn from the experiment. In the Southern Shan States no rain fell after the basic slag was tried and therefore no results can yet be known. The experiment was made with lands growing wheat, strawberries, and potatoes.

In Bassein the experiments were made on paddy-land. The unmanured plot gave an outturn of 1167 lbs. The unmanured plot with seedlings manured showed an increase of 7 per cent. in the yield. A manured plot with unmanured seedlings gave an increase of 36 per cent. and with both field and nursery manured the increase was 53 per cent.

SECTION VI.

AGRICULTURAL EDUCATION.

22. The Superintendent of the Southern Shan States has this year attached four Shan apprentices from the States to the garden at Taunggyi, in the hope of encouraging fruit culture among the Shans of the Southern States.

Enquiries were made, at the request of the Committee of the Insein Reformatory Jail, for an instructor in elementary theoretical farming but no qualified man with a good knowledge of Burmese could be recommended.

There are as yet no signs among the Burmans of a desire to acquire a more scientific knowledge of agriculture through the medium of a school, and without a farm for practical illustration of agricultural experiments a theoretical training would be of little use to them. Many improvements in modes of agriculture are fully appreciated, and Burmans are ready to adopt new instruments which combine increased utility with cheapness of price, but the average farmer cannot indulge in experiments on a costly scale.

The advantages of the application of manure are fully known to the cultivator and in Upper Burma cattle manure is frequently spread in small quantities in the fields. The Chinese gardener uses both cattle manure and night soil, and bats' guano whenever he can get it. Artificial manures are almost unknown

and their cost is generally beyond the means of the cultivator. The good results obtained from well-selected seed are not ignored, but seed selection is governed to some extent by the demands to the market. Owing to the high wages prevailing in Burma, labour and time-saving appliances and implements, whose cost is not excessive, would be welcome to to the cultivator, but at present he is somewhat indifferent or too lazy to avail himself of them. The efforts of the agricultural department have hitherto been mainly directed to the introduction of new staples or new varieties of staples, whether from other parts of the province or from foreign countries, and have met with a moderate degree of success.

The survey schools provide a sufficient number of trained surveyors for the Land Records department and no change has been made in the subjects taught or in the form of teaching.

SECTION VII.

23. The Burma Famine Code was amended during the year in accordance with the suggestions made by the Famine Commissioners in their report on the Famine of 1896-97. The programme of relief works in each district was also revised. A separate famine relief work programme was drawn by the Superintending Engineer, Irrigation Circle, and distributed among the programmes of the various districts from which the irrigation works were accessible. The weekly crop reports and the retail and wholesale price of food grains and salt, and the monthly variations in the wholesale price of food grains are regularly published.

24. The forecasts of the rice crop were published as before. The amount of cargo rice available for export was estimated to be 2,054,000 tons in the final forecast in March. Up to date the export of rice amounts to 1,690,000 tons. The amount of paddy and rice imported or exported from or to Upper Burma is no longer registered. A forecast of the cotton crop was published for the first time this year for the principal cotton growing districts, Thayetmyo, Meiktila, Myingyan, Lower Chindwin, and Sagaing. The area under cotton was conjectured to be 161,235 acres and the output at 32,900 bales of 400 pounds each.

SECTION VIII.

Finis.

A. GAITSKELL,

Director of Land Records and Agriculture, Burma.

The 10th September 1900.

APPENDICES.

List of Appendices.

Appendix I.—

1. Report on the experimental garden at Sinlumkaba, Bhamo district.
2. Report on the experimental garden at Falam, Chin Hills.
3. Report on the experimental garden at Taunggyi, Southern Shan States.

Appendix II.—

Statement I.—Description of seeds received, &c.
Statement II.—Distribution list of seeds.
Statement III.—Tobacco seed.
Statement IV.—English vegetable seed.
Statement V.—Ground nut seed.

REPORT ON THE EXPERIMENTAL ORCHARD AT SINLUM FOR THE YEAR 1899-1900.

THE proposal to establish this orchard was made by me in 1898 and the grant for 1899-1900 is the first that has been made. The orchard is, therefore, as yet in an inchoate condition and the report must necessarily be meagre and uninteresting.

My original idea in starting experimental fruit cultivation in this district was to effect the introduction of the European fruits in the hills, as I was not then aware that several kinds of such fruits could be grown with equal success in the plains of Bhamo; the efforts of the year have therefore been entirely devoted to the starting of the orchard at Sinlumkaba. I must explain at the outset that the scope of the scheme differs considerably from that of the Southern Shan States garden. What I am anxious to grow here is that class of products which cannot be grown on the plains. It is obviously no use getting the Kachins to produce things which will have to compete with those which can be grown much nearer the market. I therefore do not intend to undertake such products as potatoes and other English vegetables which can be grown very well in Bhamo, or cereals such as wheat. Again, fruits that will not bear transport are of no use to my scheme, and strawberries which grow here excellently will be grown only in small quantities, and attention will be directed to such fruits as apples, pears, and walnuts, and such vegetables as the Japanese artichoke (*corne japonai*) which cannot be grown on the plains. There is no appreciable European population at Sinlum, so that it is mere waste of time to grow celery and sea-kale and similar vegetables for the sake of possible profits. That they would grow, if planted, needs no demonstration. To the question of fruits growing in Bhamo I shall revert later.

The beginning of an undertaking of this sort must, of necessity, be very modest. It is as easy to experiment with 20 trees as with 100 and the necessary failures will involve but little loss. The orchard should therefore for many years be kept within much smaller dimensions than that of the Southern Shan States which now has many years of successful life behind it.

The grant.—To proceed to details, the grant for the year was Rs. 4,165 of which all but Rs. 311 was spent, of which full details are given in Statement B.

Receipts and expenditure.—The principal items of expenditure were the cost of the—

	Rs.
Gardener's quarters and godown	709
Cost and freight of fruit-trees	708
Fencing of garden	468
Jungle clearing	398
Establishment	1,124

There were, of course, no receipts.

Work for the year.—The first consideration in starting the orchard was to select a site, and I decided to select one which should combine the ordinary features of the surrounding country so that we might learn the treatment and the products suited to the various conditions of the hills. To this end a site close to the Civil officer's bungalow at Sinlum was chosen, containing steep and gentle slopes, rocky and sandy declivities, and a considerable piece of marshy land, the drainage of which was an instructive study and the cultivation of which will, in the course of time, present most interesting problems. An area of some eight or ten acres was cleared and partly stubbed up, and fruit and nut-trees to the number of 431 were planted. These included the following:—

Apples	39
Pears	23
Plums	28
Peaches	53
Apricots	34
Nectarines	37
Cherries	32
Currants	73
Gooseberries	53
Figs	5
Almonds	1
Lichis	3
Oranges	12
Loquats	6
Persimmons	3
Walnuts	26
Chestnuts, Spanish	3
Total	431

The majority of these were obtained from Messrs. Hugh Lowe and Company, Clapton Nurseries, the Southern Shan States garden, and Saharanpur Botanical Gardens supplying

the remainder. The English trees arrived in the end of January in good condition, but in many cases the more forcing temperatures through which their voyage had brought them had induced a commencement of growth, and when the trees were planted out the cold climate of this place killed everything above the root, and the result was that in many cases the stock only survived. These will be grafted on again later on. In almost every case the filbert and cobnuts appeared to have perished utterly; most of them have, however, sprung up again strongly from the roots. The gooseberries and currants also suffered sadly, but a considerable number are still alive; and it remains to see how the rains will treat them. The pears, apples, peaches, apricots, plums, walnuts, persimmons, cherries, and figs are growing luxuriantly. The peaches, though making excellent growth, have suffered badly from *aphis* which will have to be seriously treated next year. The few loquats are doing well so far; the lichis so far are a failure, another attempt will be made with them.

For reasons that will be referred to later on, it will be necessary to procure for the place such trees and such varieties as will ripen either before the 15th June or after the 15th October, the interval being an almost sunless period of rain and mist. To obtain this end we shall hope to graft largely on the indigenous fruit-trees. Of these there are good stocks of peach, plum, cherry, apple, pear, quince and apricot obtainable, and a start was made during the year by collecting—

35 cherries,	72 peaches,	11 quinces,
8 apricots,	26 plums,	10 pears.

An attempt was made to bud on these early in the year without much success. A further experiment will be made in June which is, I believe, the proper month. A small number of strawberry plants were obtained, and at the date of writing, May 25th, are bearing a good crop of fruit.

As trained Burmese gardeners do not exist, it was found necessary to obtain a head gardener on Rs. 40 a month and two assistants on Rs. 15 each from India. These were procured through the good offices of Mr. Gollan of the Saharanpur garden. The head gardener, Khar-uddin, seems to understand his work, but the unwonted cold paralyzes his faculties; one of the others was a complete failure for the same cause, and has now left us; the third is a strong, hardworking man. The remaining two men are a Lashi and a Yawyin locally obtained, and Kachin coolies are hired as required.

In connection with the question of the kinds of fruits suitable for culture in the hills, a few words as to the climate of Sinlum may not be out of place. The average maximum and minimum temperature for the months of the year are as follows:—

Month.	Average maximum.	Average minimum.
January ...	65	48
February ...	63	51
March ...	62	51
April ...	74	58
May ...	76	57
June ...	66	59
July ...	65	61
August ...	68	62
September ...	68	60
October ...	65	59
November ...	67	54
December ...	63	46

The average maximum in April is 12° lower than that of Maymyo and 31° lower than that of Mandalay. The teperature is curiously equable, maximum and minimum differing but a few degrees. There is fairly severe frost during four months of the year, but this is chiefly in the hollows, the hill sides being scarcely touched. Pansies flowered continuously from November to June. The shade temperature in the hot weather is lower than that of an English summer, but the sun temperature is, of course, much higher, and to this we must look to ripen the European fruits. The rainfall will probably average about 110 inches, but gets as high as 150 in an exceptional year such as last year.

During the rains, a season of continuous mist, nothing can ripen. The indigenous cherries, strawberries, and raspberries ripen before the rains; the apples, pears, peaches, plums, quinces, and persimmons after the rains, and we must endeavour to obtain the same results.

The experience of the last two years has taught me a thing which I had not suspected before. This is, that some, at all events, of the English fruits and some Indian fruits that are not now cultivated in Burma, will grow excellently in Bhamo. In my own small orchard I had this year a fine crop of peaches and also of a small black plum; and I also raised a crop of stawberries during February and March which for quantity I have never seen equalled even in England, though the flavour was not quite equal to that of the home-grown variety. I have also a small lichi tree in full bearing.

I propose, therefore, without any additional expenditure, to start a small branch orchard at Bhamo in which attention will be directed specially to the growth of those fruits that are not cultivated in Burma as yet.

By this double arrangement we shall get two crops of European fruits in the year. This year the strawberry crop in Bhamo lasted from the beginning of February until well into April and was closely followed by the Sinlum crop now in full swing. In the same way the Bhamo stone fruit will ripen in May and June and the Sinlum crop will come on in October and November.

The garden at Sinlum has been in charge of Mr. Rae throughout the year, who has taken great interest in it.

STATEMENT A.—*Actual total receipts and disbursements from 1st June 1899 to 31st May 1900 (year under report).*

Receipts.	Amount.	Disbursement.	Amount.
	Rs. A. P.	On orchard.	3,853 5 11
By budget allotment, *i.e.*—			
(1) One gardener at Rs. 40	480 0 0		
(1) Four under-gardeners at Rs. 15	720 0 0		
(2) Purchase of seeds	600 0 0		
(3) Up-keep of garden	600 0 0		
(4) Clearing, fencing, trenching, and water-supply of orchard	750 0 0		
(5) Miscellaneous contingencies	1,015 0 0		
Total ...	4,165 0 0	Total ...	3,853 5 11

STATEMENT B.—*Details of disbursements from 1st June 1899 to 31st May 1900.*

Details.	Amount.
Orchard.	Rs. A. P.
(1) Establishment (pay up to end of March 1900)	1,124 10 8
(2) Steamer and railway fares of gardeners from Saharanpur to Bhamo (Sinlumkaba).	152 8 0
Remittance of advance taken from Saharanpur Garden Superintendent, Rs. 51-8-0, money order commission ten annas.	52 2 0
(3) Cost of building gardener's house	708 15 0
(4) Cost of two bullocks and their saddlery, including cost of carriage from Bhamo to Sinlumkaba.	106 14 8
(5) Cost of tools and necessary things purchased locally and the carriage of the same ...	25 8 0
(6) Fencing garden	468 8 0
(7) Cost of fruit-trees	492 6 7
(8) Cost of seeds	106 2 0
(9) Freight on fruit-trees	216 3 0
(10) Jungle-clearing, fencing, trenching, and water-supply, &c.	398 0 0
(11) Miscellaneous	1 8 0
Total ...	3,853 5 11

REPORT ON EXPERIMENTAL CULTIVATION IN THE CHIN HILLS FOR THE YEAR 1899-1900.

THIS is the first annual report submitted, although the vegetable garden was started in 1897 and the first fruit trees planted in 1898-99.

Grant.—The grant for the year under report was Rs. 1,230, and remained the same as allotted in 1897-98 and 1898-99.

Expenditure.—The total expenditure under all heads was Rs. 911-8-0 as against Rs. 244-13-5 and Rs. 940-13-8 for the two previous years respectively.

Annexure B gives full details of expenditure incurred during the year.

Fruit Orchard.—Two hundred fruit trees were obtained in 1898-99 from the Assistant Conservator of Forests, Naini Tal; 100 of these were planted in Falam and 50 at each of the posts of Tiddim and Haka. Of those planted at Falam 79 are still thriving, 21 only having died.

At Tiddim and Haka the percentage of losses is very much higher; at the former post only 15 trees are still alive and at the latter 20. These losses may be attributable to the fact that Tiddim is a more exposed post than either Falam or Haka and feels to a greater extent the force of the heavy winds which are prevalent all over the hills during the months of February, March, and April, whilst Haka lies at a higher altitude than either of the other

two posts. At all three posts the trees have been well pruned and carefully looked after, but undoubtedly the trees at Falam have grown more and have a healthier appearance than those at Tiddim and Haka. The 200 trees were comprised as follows: —

Apples	50	Plums	50
Pears	50	Peaches	50

and from the statement attached to the report it will be seen that the plum and peach tree have done the best.

The majority of the trees, however, arrived unlabelled, so it may be possible that the identification of the various sorts is not quite correct. As the trees begin to bear fruit a correct identification will be made.

Mr. Street, Assistant Superintendent, Falam, who has some practical knowledge of gardening, was placed in charge of the fruit orchard and vegetable garden in Falam. I give some interesting extracts from his report :—

* * * * *

"The fruit tress have been well pruned and a few of the peach trees have flowered this spring, but the fruit is small and does not seem likely to ripen. A small quantity of young wild peach trees have been planted and, when big enough, will be grafted with shoots from good trees."

"A few gooseberry and red and black currant seeds have been obtained from the Seed Stores, Mussoorie, but it is doubtful whether they will germinate.

"There is no likelihood of any results from the orchard for several seasons to come as the trees are all very small at present.

"The names of the fruit trees have not been recorded, and as they were not labelled, it is impossible to state accurately what trees are in the orchard until they begin to fruit; but as far as can be judged from the leaves there are —

Apple trees, assorted	19	
Plums	26	
Pears	1	(There are probably more.)
Peaches	33	(Some of these trees are probably nectarines or apricots.)

"All these trees are very healthy and growing rapidly.

"*Vegetable Garden.*—The garden is small, being only about half an acre on the side of a hill facing south-west. The gardener, who is a Sikh, is illiterate, and although he has now been working for three or four years, does not know much more about vegetables than when he started. He can grow the ordinary run of vegetables well, being able to remember the months in which to sow, but is continually having failures owing to attempting to plant certain varieties in wrong season.

"Vegetables grow in Falam nearly all the year round. From December to March there was always a continual supply of cauliflowers, peas, lettuce, beetroot, carrots, turnips, knolkohl, and radishes.

"Late sowings of cauliflower, mostly from English seeds experimented on, did not flower at all, while broccoli was a complete failure. Cabbages have been very plentiful since April and are not nearly finished; the heads are big and solid.

"The celery planted was good, but the quantity sown was insignificant. Tomatoes were sown in February, but when planted out, the cold winds in March killed every plant. A crop planted in March is doing very well and is likely to last for another month or so, the fruit being very big and of good flavour. A small quantity of young plants were handed over to Chins in a village about 1,000 feet lower than this and are doing well at present. A large quantity of onions (white Spanish) were sown and have done very well; they have grown to an enormous size, and, if properly looked after, will supply a great part of the demand there is for them.

"Carriage to Falam is so expensive that, if a big crop of onions is put down next season and sold at a cheap rate, the receipts from the sale ought to be very satisfactory. The present rate in the bazaar here varies from Rs. 1-8-0 to Rs. 2 per viss compared with four to six annas per viss in Burma.

"Brussels sprouts have not done well; the crop was almost a total failure.

"Vegetables that do well during the rains are French beans, peas, carrots, lettuce, vegetable marrows, and cucumbers. The marrows and cucumbers are already very plentiful: the others are not yet in season.

"An attempt will be made this season to plant asparagus and rhubarb.

"*Potatoes.*—I have just received 120 lbs. of kidney potatoes from the Superintendent, Shan States, which have been put down, although it is rather late; there will probably be sufficient for sowing next season. They will be greatly in demand, as at the present time it is impossible to get potatoes anywhere."

* * * * *

The Chins in Tiddim subdivision grow potatoes in good quantities. The quality of these potatoes varies considerably, at certain times the crops being good, whilst at others

bad. This is due, I think, partly to the varied nature of the soil the Chins plant in and partly to the seasons in which the seeds are sown.

Perhaps the crops sown during the months of October and November are the best, but it is difficult to state anything on the point with any certainty until further observations have been made.

Chins do not grow potatoes for their own consumption, but merely for trade purposes. As soon as they find no sale for them I am afraid they will cease growing them.

Strawberries.—Strawberries appear to do so well that it is propsed to open out many more beds at Falam. At present there are only six small beds in the garden and the crop obtained from them was an exceptionally good one. The plants commenced to fruit in February, and in March and April good crops were obtained, the size and flavour of the fruits being very good.

At Haka, where plants were sown some years ago, the crop was exceptionally good this year, whilst at Tiddim, where plants were only sown last year, the results, although not so good as the other two posts, still justify the hope that in time good results will be obtained.

Establishment.—The establishment consists of one gardener and one servant, both of whom are retained in Falam. No experienced gardener could be obtained on the pay offered, although every effort was made in previous years to obtain the services of one. Consequently no alternative remained but to engage a man up here who showed slightly more intelligence than is usually found in men of his class.

The present gardener is illiterate, and his knowledge of gardening is very limited. His ideas are quaint, and on the few occasions he has given play to them the results have been disastrous. However, he is the only man obtainable, and with stricter supervision he may improve, although I fear he is too old to learn better.

Small vegetable gardens are kept up at Tiddim and Haka, and are under the charge of the Assistant Superintendent in each post. A small monthly allotment is allowed each post, which permits of hired labour being employed on the gardens.

At Tiddim, owing to the scarcity of water and to the fact that the water-supply lies at a distance below the post, the grant is swallowed up in paying carriers to bring water to the garden. At Falam and Haka this difficulty is not experienced as water is let into the posts by means of wooden ducts.

Wheat and Oats.—It is proposed to make experiments in wheat and oats. The former should do well, but at present the difficulty lies in finding a level piece of ground in which to sow. Attempts are now being made to select a suitable site.

General.—Nothing can be expected from the fruit orchard for some years to come, but the trees in it appear to be doing so well that I think I am justified in saying that, when they do bear, the profits obtained on the sale of the fruits will soon cover the expenditure incurred on the orchard.

At Tiddim heavy hail-storms during March and April caused considerable damage to the vegetable garden. So far vegetable gardening in these hills has been of an experimental nature and the results have been so uncertain and varied that no profits could be obtained. Now that the experiments have shown that vegetables will grow and thrive up here, I propose obtaining small receipts by supplying the produce of the gardens (with the exception of potatoes and onions) to inhabitants of the post on payment of a small monthly subscription. Potatoes and onions will be sold by weight, and as the demand for them is great, the receipts should be substantial and go a great way towards meeting the outlay incurred on the garden. I also propose selling strawberries at reasonable rates next year, and if the output is as satisfactory as this year's, the receipts should be by no means insignificant. I do not for one moment suppose that the total receipts will cover the expenditure incurred, but there appears no reason why they should not go a long way in helping to meet it.

The main garden lies at Falam, and any surplus seeds not required for the garden are sent to Tiddim and Haka, where, as I have stated before, small gardens are kept. The main receipts will be derived from the garden at Falam, and any which may be obtained at Tiddim and Haka will be very insignificant.

I am afraid the sale of the produce will be strictly limited to the inhabitants of posts only, as Chins, who are very conservative in their ideas, will have nothing to do with our vegetables, unless it is merely to grow them with the object of selling the produce to us. When the fruit trees bear, there should be no reason why any surplus fruit not required up here should not be packed in boxes and sent to the plains for sale. It is too early, however, to venture any opinion on this subject as yet.

FALAM:
The 23rd August 1900.

E. O. FOWLER,
Offg. Superintendent, Chin Hills.

STATEMENT A.

Actual total receipts and disbursements from 1st April 1899 to 31st March 1900.

Receipts.	Rs.	Disbursements.	Rs. A. P.
By budget allotment, 1899-1900 ...	1,230	On orchard and garden establishment 1899-1900	540 0 0
		Contingencies, 1899-1900	371 8 0
		Total expenditure ...	911 8 0
		Balance	318 8 0
Total receipts ...	1,230	GRAND TOTAL ...	1,230 0 0

STATEMENT B.

Details of disbursements from 1st April 1899 to 31st March 1900.

	Rs. A. P.
(1) Establishment consisting of— One gardner at Rs. 30 per month, One servant at Rs. 15 per month	540 0 0
(2) Up-keep of garden, such as extra coolies employed on the gardens and orchards at Falam, Haka, and Tiddim...	200 0 0
(3) Purchase of seeds	.....
(4) Fencing, &c.	137 8 0
(5) Miscellaneous, such as fumigating, cases, &c. ...	34 0 0
Total expenditure ...	911 8 0

STATEMENT C.

List of fruit trees.

Name of trees.	From Naini Tal.	Remarks.
At Falam.		
Apple trees	19	Assorted.
Plums	26	
Pears	1	
Peaches	33	Some of these may be nectarines or apricots.
At Tiddim.		
Apple	3	
Peach	5	
Plums	7	
At Haka.		
Apple	11	
Plums	9	

Statement showing rainfall at Falam, Tiddim, and Haka for the year 1899-1900.

Month.	Falam.	Tiddim.	Haka.
April 1899	1·89	3·64	1·84
May 1899	8·26	7·14	12·71
June 1899	16·16	12·38	16·53
July 1899	13·19	12·80	17·51
August 1899	13·19	10·08	11·70
September 1899	10·63	7·68	17·40
October 1899	7·55	7·30	10·81
November 1899	1·85	2·71	1·25
December 1899	0·63	0·91	0·85
January 1900	.....	.....	.....
February 1900	0·16	0·70	0·30
March 1900	2·46	3·74	1·97
Total for 1899-1900 ...	75·97	69·08	92·87

REPORT ON EXPERIMENTAL CULTIVATION IN THE SOUTHERN SHAN STATES FOR THE YEAR 1899-1900.

THIS is the ninth annual report, but only the sixth year since the first trees were imported and planted in the orchard.

2. *Grant.*—The grant for the year was Rs. 4,116, which has been found to be sufficient.

3. *Expenditure.*—The total expenditure under all heads has been Rs. 3,843 as against Rs. 3,248 for last year, an increase of Rs. 595. The details of expenditure will be found in Statement B annexed.

4. *Receipts.*—The total receipts from sales has been Rs. 1,649, *vide* Statement A annexed, as against Rs. 1,807 for the preceding year, showing a falling off of Rs. 158. Last year there was a small sum credited which was a balance due from the wheat experiment of the previous year of Rs. 193 and as explained in my last report the growth of wheat has now gone beyond the experimental stage and has no further connection with the Government. If this item is eliminated from last year's receipt the sales are a shade better for the year under report, showing a surplus of Rs. 35.

The total expenditure being Rs. 3,844 and receipts credited to treasury Rs. 1,649; the actual expenditure on the upkeep and improvement of the 40 acres of orchard therefore amounts to Rs. 2,195. The year has been an exceptional one in many ways, which has enhanced the expenditure on the one hand and tended to reduce the receipts on the other as will be detailed below.

5. *Work for the year.*—Hitherto the vegetable garden has been quite separate from the orchard, having a separate water-supply. In October 1899 a large bund immediately above the vegetable garden gave way and the whole garden was flooded and gutted of its contents. The soil, however, still remained in the greater part of it, and when the bund was once more repaired by the Public Works Department a large gang was set to work to replace with fresh soil and manure the portion that was washed away and the portion that was bereft of crop but not of soil was turned over and made ready to receive seeds or young plants in November. While this work was in progress, once more the bund burst and on this occasion, the soil lying light and having no crop to protect it, the whole garden was so completely wrecked that it had to be abandoned. Such things as asparagus and crown artichoke plants, &c., that could be extracted from the *débris*, were transported to a new site in the orchard, but it was not till last month (May) that there was a stock of vegetables to offer to the general public. I had already spent Rs. 56 in fresh soil and manure to repair the damage done by the first flood when the second flood came. In addition to this loss was that of the collections from the monthly subscribers for vegetables for seven months which amounted to Rs. 112, so that the total loss to the garden was not less than Rs. 170. There is now, however, a very flourishing vegetable garden in the low-lying portion of the orchard which was formerly used for fruit stock nurseries, which latter are now made in between the young fruit trees *in situ*.

These nurseries now contain many thousands of young trees for grafting the various kinds of fruit trees upon and are looking healthy and vigorous. These will be grafted this year (1900-1901), but it is not until the year following that they will be available for sale or presentation.

The few apple, pear, and cherry stocks that were fit for grafting in February and March last were all grafted or budded and are doing well, and there will be a few hundreds for sale in the winter.

As I found in my tours that the grafted fruit trees obtained by the various Shan Chiefs were neither properly planted nor properly tended, and that many had relapsed into their wild state, I commenced a scheme of having probationers in the orchard for instruction, which I had long intended to do but which had not as yet been attempted. As the Myelat is the only part of the Southern Shan States which is near enough to the only market there is, namely, the Burma Railway, to be able to send fruit there for sale, at present probationers are admitted from the Myelat States only and a start has been made with four. They are natives of the country and are sent by their chiefs to learn how to plant, graft, prune, and generally tend to fruit trees. Their pay is paid while they are under tuition, half by the chief and half out of my experimental cultivation grant, at the rate of Rs. 12 each monthly, and they are bound to remain for two years at least and may be retained for another year if they have not then acquired a fair knowledge of the work. In this way I hope to get a large portion of the many thousands of young fruit trees now in the nurseries planted out in the Myelat with some hope of ultimate success and profit to the States. It will also be a great boon to the European inhabitants of Burma who live near the railway. The start made last year in the sale of fruits has been maintained, but although there was a bumper crop of strawberries the demand was not brisk and the amount realized shows a considerable falling off from the year previous. I have, therefore, reduced the area under strawberries for the present year (1900-1901) and so made room for a good

supply of vegetables. Many of the trees in the old orchard planted by unskilful hands when the orchard was first started in 1893 and 1894 have failed either to fruit or to grow properly. In some 15 acres I have this year had all such trees lifted and the pits redug and having root-pruned the trees they have been replanted when they showed fair signs of being worth it. Many, however, were not worth replanting and have been replaced by young apple trees. This operation cost a considerable amount of labour, but from the already altered appearance of the trees it was well spent.

As with the planting in the early days so with the grubbing up of the indigenous scrub jungle. It was incompletely done and the young bushes had in the course of years made such headway again that I had the whole orchard redone this year. This had to be done partially by hired coolies and cost over Rs. 200.

The godown and gardeners' houses also had fallen into such disrepair that I had to spend Rs. 300 on rebuilding and repairing them.

Gaps in the road-side trees in the station were also made good by some 100 trees.

Some hydrangeas, fuschias, and other flowers were also added to the former stock of flowers and a large stock of rose cuttings were put in, and in most instances are doing well. These additions to the *flora* were made by exchange with Mr. W. Gollan, the Superintendent of the Government Botanical Gardens, Saharanpur, to whom I sent some of the indigenous lily bulbs.

Last year at least two-thirds of the apples were pecked and destroyed by bulbuls. The head gardener is now furnished with a suitable gun and ammunition, and so far the damage done by these pests is very slight.

An experiment was made with "basic slag" on potatoes, strawberry plants, and fruit-trees.

As my former grape vines would do no good, a number of new varieties were imported, also from Saharanpur.

6. *General remarks.*—Only natives of the States have been employed either on the permanent establishment or as coolies, as heretofore. Once more the year has been a trying one on account of the drought, as there was no rain from the middle of November to the end of April, over five months.

It has therefore been disastrous to the cold weather potato crop, and the young apple trees transplanted in February to March have suffered considerably.

At the end of April there was a heavy fall of rain which came just in time to fill out the peaches, of which there was a very heavy crop, before they ripened, but it also gave birth to a plague of cockchafers, which attacked the ripening and green peaches with such good will that what they left I had picked green and sent to the bazaar and sold for what they would fetch. This is quite a new pest and each year seems to bring one worse than the last. At the commencement of May there were many trees laden with fruit, some ripening, some half grown, and some still smaller.

At the end of May every peach was gone. I have determined to have at least some of the trees netted with some small insect-proof netting next year, similar to that used for keeping out wasps at home.

Two of the peach trees planted by the Chief of the Pwehla State in the Myelat fruited for the first time this year, and he was permitted by the cockchafers to pick and eat his fruit, which was exceedingly fine. This has given great satisfaction to the people of his State who have already sent in asking for young trees. I regret I am completely sold out and have none to supply.

7. *Establishment.*—The strength of the establishment remains the same and Maung Sè, the head gardener, has continued to give entire satisfaction. His staff, however, of the older hands has dwindled down to one only and he has only been retained by a promise of increase of pay.

What with the public works on roads, bridges, and house-building going on, and the rates paid to contractors, the present scale of pay is not sufficient to keep the men. I am therefore revising the rates of pay and reducing the number of under gardeners, which the assistance of the probationers enables me to do, so that, while paying sufficient, I hope to retain the services of the men, and there will be a slight decrease in the cost of the establishment.

The services of the older hands must be retained at all costs as new hands do more harm than good in the higher branches of the work that is now required of them. I have therefore increased the pay of the only remaining old hand, the first assistant gardener, Ohdhama, from Rs. 15 to 20 a month, and on these terms he has agreed to serve for another three years at least.

The four probationers only commenced work in May.

The clerk, Maung Po Si, continues to give satisfaction.

8. *Vegetable garden.*—As mentioned in a previous paragraph this garden came to a sudden end in October. It is the more regrettable as the water-supply for the orchard, especially the strawberries, has always been deficient towards April, and the spring which was utilised for the old vegetable garden now runs to waste as far as gardening is concerned. However, by reducing the area under strawberries, in proportion to the decreased demand

for the fruit, I hope to make both ends meet and to be able in the future to provide a limited supply of vegetables as usual.

The old stools of asparagus which were moved from the old garden have done excellently and are now giving a good supply of excellent asparagus. It is perhaps worth while to record that these old roots had been yielding cuttings in the most prolific manner since 1892—7 years. As I did not know how these old roots would stand the move, I made two new beds. These are doing most excellently and will be cut sparingly a little later.

The crown artichokes that were moved have also done well and yielded a most prolific crop of crowns.

Since the rain commenced to fall at the end of April, all the vegetables which were stunted before for want of sufficient water have done well and four houses are now being supplied at the low rate of Rs. 4 per house per month.

Sea-kale continues to do well on the raised bank, and by dividing the roots I have doubled the number of plants. To do so, however, the plants had to be moved, so that they have yielded no cuttings so far.

The treatment of bleaching through sand had not rotted or destroyed any of the old roots, so the experiment may be considered a hopeful one, but as it has only been tried for one full year it is too early yet to pronounce it as a success.

The rhubarb was watered occasionally and sparingly during the dry months. This seems to be the way to treat it as the deaths from drought have been few and those only of very young plants. The older and well established plants are now looking excellent.

Some more Jerusalem artichoke tubers were obtained from Saharanpur. So far but few have germinated, but look healthy and will no doubt germinate later.

From the 1st June 1899 to the destruction of the gardens in October the expenditure on the vegetable gardens was Rs. 169 (including Rs. 56 spent in remaking it after first inundation) and the receipts Rs. 129, showing a loss of Rs. 40.

9. *Wheat.*—Though not now connected with this grant, it may be noted that the crop in the Yawnghwe State is reported as an unusually good one and that the *Sawbwa* will not only be able to supply the 13 lacs of pounds required by the Commissariat Department, but will have a large surplus. The disposing of this surplus at a profit, however small, will be his difficulty at the present rates of cart hire. So far certainly there has been no falling off in the cultivation of this cereal since the fostering of it was made over to the Yawnghwe *Sawbwa*.

A further effort to introduce its culture at Kēngtūng for the supply of the garrison there was made this year and about 5,000 lbs. of seed was sown. I have not as yet heard what the exact yield was, but it was about threefold, which is what I hoped to succeed in getting. This will enable the experiment to pay its way and this year a further advance will be made by a distribution of 10,000 lbs. of seed. There is every reason to believe that wheat will in course of time be successfully grown there in sufficient quantities for the supply of the garrison and there the production must end, until there is a railway to carry it to a market, as the people of the country do not use it.

This experiment is being conducted quite independent of this grant, but is noted here as being of considerable general interest.

10. *Potatoes.*—Though no longer a remunerative crop at this distance from the railway (106 miles), I again put them in for the benefit their cultivation is to the young fruit trees among which they are grown. The labour was mainly done by the garden staff, but some coolie labour had also to be employed as the area was too great for the regular staff to get over in time. This extra coolie labour cost Rs. 106, while the cart hire down to the railway came to Rs. 898. Rupees 1,004 was thus spent on the crop, without considering the time employed by the regular staff and when sold the whole crop only realized Rs. 1,354, leaving a balance of Rs. 350 to the credit of the orchard.

The crop was a fair one, but not as good as the appearance of the plants promised. The rainfall was so heavy and constant that the wet-weather crop (for I get two in the year) ran to leaf and the tubers were small and few and the dry-weather crop was ruined by the prolonged drought as I have no means of irrigating it.

The sowings and yield were as follows :—

	Sown.	Crop dug.
	Viss.	Viss.
April 1899	1,321	14,313
October 1899	1,415	1,110
Total ...	2,736	15,423

The total returns were, therefore, not quite six-fold on the two crops. The season was distinctly unpropitious. I tried an experiment with an artificial manure "Basic slag" which the importers recommend to be used at the rate of five bags of 100 lbs. each per acre.

Two small blocks of one-fifth of an acre each were selected and marked off, one in black, loamy soil and one in the usual red soil of the country.

One bag of the manure was distributed broadcast on each after the tubers had germinated and at the time of hoeing them up for the first time. Neither in the appearance of the plants or in the outturn was there any perceptible difference from the neighbouring blocks.

This was tried on the October sowing and as there was no rain after they were hoed up the drought was perhaps the cause. I have now a further sowing on these blocks put in in April and will watch the result on the wet-weather crop.

Small quantities of seed potatoes were sent to the Superintendent, Chin Hills, and to the Deputy Commissioner, Katha, for cultivation. I have not heard the result.

For the wet weather crop 800 viss have again been shown in April, although potatoes cannot be regarded as a paying crop any longer now that the rates at the railway have gone down so much, they can still be grown at a profit, though a small one, in the Myelat where the haulage is less. This year, however, the rates at the railway later in the season ruled so low that there are considerable quantities of tubers now lying in the ground undug as they would not pay for digging.

In one State, potatoes in considerable quantities were sold for *eight annas per 100 viss.* It is therefore certain that those who live furthest from the railway will now discontinue this crop, or at any rate reduce their sowings.

It is a thousand pities that we have no railway within range to open up these States.

The growth of potatoes was started in the Myelat and in the orchard here in the rains of 1892, when 2,330 viss of seed was distributed in the Myelat and 50 viss was shown in the orchard.

From this commencement, thanks to the good rates then obtaining, and to the opening of the Government cart-road, the growth has now assumed considerable proportions, as the following figures will show. Besides these exports to Burma a certain portion of the crop is now consumed locally though the use of potatoes as an article of food of the population cannot as yet be regarded as in any way general.

The following figures are supplied by the Director of Land Records and Agriculture.

Potatoes imported into Burma from the Southern Shan States, 1897.

	Maunds. Acres.	Value. Rs.
1897-98	30,594	1,22,814
1898-99	43,088	1,46,428
1899-1900	46,380	1,29,887

It will be seen from the figures below that the average price per maund has steadily decreased annually as follows:—

	Average price per maund. Rs. A. P.
1897-98	4 0 2
1898-99	3 5 7
1899-1900	2 12 9

In the meantime cart-hire has increased from 30 to 50 per cent. upon what it was in 1897.

The future of potato growers is not therefore cheerful even within the Myelat. Beyond that, it is, of course, hopeless.

With a railway the 1,656½ tons of potatoes now exported from the Myelat would in the course of a few years be quadrupled in the Myelat itself and extending the culturable area into the Eastern State, the outturn there would soon be fourfold that of the Myelat when thus increased. The tonnage in potatoes alone to be carried by the railway would be considerable.

11. *Orchard.*—The strawberry crop was as good as or better than usual. The plants commenced to fruit freely in December and pickings were made up to the end of May. As is always the case the berries fell off in size as well as flavour towards the middle of March. I noticed that the same thing happened last year and in previous years, and from the appearance of the plants it occurred to me that it might be the result of the stoppage of dews at night. I therefore selected four beds in different parts of the area and in April I commenced to water them in the evening with the rose as well as irrigation; by the end of April there was a distinct difference in the beds thus treated, and next year I shall commence to water with the rose directly the dews at night cease falling and by this means I anticipate the crops will continue to be in April as it was in February. Although the outturn was heavier than last year there was a smaller demand for the fruit and 114 viss only was sold as compared with 175½ viss last year; the receipts on this account therefore dwindled from Rs. 88 to Rs. 57. A good many were also given away gratis to native visitors to Taunggyi.

As already noted in a previous paragraph I have reduced the area under strawberries so as to allow more area and more water for vegetables.

The effect of basic slag on strawberries was tested by the following experiment while the plants were quite young in October in two beds of four rows to the bed, in which all the plants appeared to be much alike; two rows were selected for the experiment.

The basic slag was applied at the rate of 500 lbs. to the acre and it was mulched into the soil round the roots with a small hoe; neither plants nor fruit in those two rows in each have, as yet, shown any signs of artificial manures having been applied. It remains to be seen whether it will effect in any way next year's crop, for I am going to leave the plants for a second year.

The peach crop was an exceedingly heavy one and from the varieties that have now come into bearing it promised to keep the market supplied for three months at least. The pickings, however, commenced in the beginning of May and there was not a peach left in the orchard by the end of that month. About the middle of May a plague of cockchafers commenced their depredations upon fruit that was ripe or green alike and in one night would clear a tree containing 20 or 30 viss of fruit. At the end of May, therefore, seeing that it was impossible to hope that the fruit would ripen on the trees, I had them all picked and sold in the bazaar for what they would fetch. Notwithstanding this destruction 116½ viss of peaches were sold and Rs. 43-8-6 were realized as against Rs. 1-10-0 last year. Thirty-three viss were distributed gratis. In order to prevent this waste again I am ordering some cotton netting similar to that used at home to keep off wasps and flies.

The nectarine trees are at the present moment laden with fruit and if the present sunny weather with occasional showers continues and some new pest does not arrive to destroy them, there should be a considerable quantity available for the public.

None of the apricot trees have yet set fruit though several of them flowered in a spasmodic manner this year. I have selected a few of the stronger ones for experiment in root-pruning which was carried out in February in the hopes of forcing them to yield a little fruit instead of branch and leaf only; the result will be communicated in next year's report.

Such of the plum trees as commenced to fruit last year had very fair crops on this year though the trees are small. One large tree was completely stripped in a single night by some thieves who must have carried off some six or seven viss of fruit, some of which could only have been half ripe. Several peaches were taken at the same time. A reward of Rs. 50 was offered for the conviction of the offenders and the police were urged to do their best to detect the case, with no result up to the present.

None of the cherry trees flowered this year.

The pear trees look exceedingly healthy and make extraordinary growth especially those that were grafted in 1897; only one tree, however, which was planted in 1894, has fruited and upon that there are four fine looking pears at the present moment.

A large number of the apple trees are now laden with fruit and several of those grafted on to *Docinia Indica* stock in 1897, and a few that were so grafted in 1898, have now some very fine fruit on them.

There can be no longer any question as to the suitablity of *Docinia Indica* as stock for European apples. Not only are there a considerable number of trees thus grafted in fruit, but I have tested the fruit by comparison both in size and flavour with that grown on the *Paradise* stock received from England and there appears to be no deterioration in either respect.

As described in last year's report the scions are always selected from the plants that were grafted in the year previous. The scions therefore grafted in February this year are from four generations of plants grown on *Docinia Indica* stock. Out of several hundreds of grafts put in every graft has taken, and so far those that have died off both stock and scion with rusty appearance described by me in the report of 1896-97 are but very few. I will, however, give exact statistics of those that were grafted in one block in February 1899. Those that are alive now are quite safe. One hundred and sixty-nine scions of the following varieties of apple were grafted:—

Cox's orange pippin.	Blenheim orange.
Dumelow's seedling.	Lord Suffield.

All these grafts took and grew equally luxuriantly to the third or fourth month when, as previously described by me they commenced to die off both stock and scion.

Instead, however, of losing 80 per cent. as I did in 1895 the deaths up to the present have been only 17 per cent. Of the 169 grafts that orginally took 140 are now alive and 29 are dead. But for these casualties the stock appears to me to be in every way satisfactory and they get less and less annually, and I have now over 1,500 apple trees *in situ* growing on the *Docinia Indica* stock.

The grape vines still continue to be a total failure. Mr. W. Gollan, Superintendent of the Saharanpur Government Botanical Gardens, sent me 18 new varieties to try. He also has sent me some seed of six different varieties. All the seedlings and plants are at present looking well.

The figs are looking better this year than they have for some years and have a considerable quantity of fruit on them. They cannot apparently stand continuous rain and the bright weather broken by occasional showers, which has been the feature of the present rainy season, up to date appears to suit them.

Currants, gooseberries, cobnuts, filberts, and raspberries may be considered as entirely extinct and cannot be grown. No further notice, therefore, will be taken of them in future reports.

Walnuts, however, though they grow slowly, grow very vigorously; the leaves look healthy and I think that they will ultimately be a success.

The orange trees look well and a few of them fruited for the first time this year. The fruit was small and wanting in sweetness as is, I believe, the case with all oranges that fruit for the first time.

For the sale of fruit trees, including strawberry plants, Rs. 160-8-0 has been credited and these trees were all that were for sale with the exception of a few that were distributed gratis as follows:—

Roses	291
Peaches	12
Strawberries	100

12. *Flowering plants.*—The narcissus, daffodil, and hyacinth flowered satisfactorily. The azalias, though still alive and growing, do not appear to like either the soil or climate, I do not know which, but certainly since I changed the soil two months ago they have picked up considerably. The camelias have also commenced to show growth as also the tree peonies, but the climate does not seem altogether to suit them and I doubt their ever doing well. I append a list of roses, which are now growing, 81 different varieties. Cuttings from many of these have been put in the orchard and are doing well and are available for sale to the general public.

13. *Financial.*—From Statement A Rs. 2,672 has been spent on the orchard while the sales from the orchard have not relaized more than Rs. 1,650 showing a deficit in the orchard of Rs. 1,022. Upon reviewing the details of expenditure in Statement B the following items will be found which may be regarded as capital expenditure and not recurring, or only recurring, after a lapse of years:—

	Rs.
For wire and pulleys for making chicks for vineries	48
Cost of a gun and ammunition for shooting small birds that destroy fruit	174
Cost of two bullocks	80
For basic slag	46
For grubbing up shrub and jungle roots	213
Total ...	561

To this may be added Rs. 293-6-0 which has been spent in re-building or repairing buildings connected with the orchard which will not occur again for another three years at least. The expenditure, therefore, has from one cause or another been extraordinarily heavy principally for items which will not be again required.

Now that potatoes are no longer a paying crop the orchard must look to the sale of fruit trees and fruit for its receipts.

The stock upon which to graft the trees is now in the ground, but grafted trees will not be ready for sale in any considerable quantities until the cold weather of 1902, and until which time the orchard will always balance the wrong way.

14. *Concluding remarks.*—A list of the fruit trees now in the orchard is appended. The trees as a rule are looking very healthy and such as were not have been lifted and replanted during the year. The young apple trees show a very satisfactory quantity of fruit; peach trees and strawberries could not do better, and there is a very abundant supply of vegetables among which the crown artichokes and asparagus would be hard to beat. Rhubarb and sea-kale also are looking well. The plum trees are coming into fruit in a most satisfactory manner and it is hoped that next year several of the pear trees will also bear fruit.

Until we have a railway it appears to me that little further advance can be made either in the orchard or outside it. I have recently written to the Government of Burma on this subject, but I fear it will be some time yet before we see the railway.

A. H. HILDEBRAND,
Superintendent and Political Officer,
Southern Shan States.

TAUNGGYI:
The 9th June 1900.

STATEMENT A.—*Actual total receipts and disbursements from the 1st June 1899 to 31st May 1900 (year under report).*

Receipts.	Amount.	Disbursements.	Amount.
	Rs. A. P.		Rs. A. P.
(1) By budget allotment ...	4,116 0 0	(1) On orchard	2,671 8 4
(2) Sale of vegetables	128 12 0	(2) On garden	168 14 0
(3) Sale of peaches	43 8 6	(3) On potatoes	1,003 7 6
(4) Sale of fruit trees	103 8 0		
(5) Sale of strawberry plants ...	54 0 0		
(6) Sale of strawberries ...	57 0 0		
(7) Sale of vegetables (orchard) ...	37 14 9		
(8) Sale of potatoes	1,353 8 0		
Total ...	5,894 3 3	Total ...	3,843 13 10

STATEMENT B.—*Details of disbursement from the 1st June 1899 to 31st May 1900.*

Details.	Amount.
	Rs. A. P.
(1) Establishment	1,615 0 0
(2) Cost of plants	14 0 0
(3) Cost of postage due on parcels	7 0 0
(4) Coolie-hire for conveying plants	6 8 0
(5) Cost of lily bulbs	9 0 0
(6) Cost of Jerusalem artichoke and vines	5 4 0
(7) Cost of wire, pulleys, &c., for vinery	48 0 0
(8) Cost of labels	32 14 0
(9) Cost of gun, ammunition, &c.	174 4 0
(10) Repairing gates	4 8 0
(11) Cost of two bullocks	80 0 0
(12) Cost of kegs paint	23 8 0
(13) Cost of basic slag	46 8 4
(14) Cost of galvanized wire	13 4 0
(15) Cost of tools	37 4 0
(16) Cost of mats	3 0 0
(17) Cost of wax, *indwe*, and *thitse*	29 8 0
(18) Cost of scales	0 8 0
(19) Cost of mending cart wheels	11 4 0
(20) Cost of building gardeners' houses	191 4 0
(21) Repairing godown	87 9 0
(22) Cost of enlarging Government bullock shed	14 9 0
(23) Coolie-hire for rooting up roots, &c.	213 4 0
(24) Miscellaneous	3 12 0
Total ...	2,671 8 4
Garden.	
(1) Establishment	84 0 0
(2) Cost of seeds	29 0 0
(3) Coolie-hire for digging drains	14 10 0
(4) Coolie-hire for manuring	41 4 0
Total ...	168 14 0
Potatoes.	
(1) Coolie-hire for hoeing	22 0 0
(2) Coolie-hire for weeding...	44 11 0
(3) Coolie-hire for preparing ground	39 2 0
(4) Cart-hire for conveying	897 10 6
Total ...	1,003 7 6

STATEMENT B.—*Details of disbursement from the 1st June 1899 to 31st May 1900* —concluded.

Details.	Amount.
	Rs. A. P
Total expenditure up to 31st March 1900 from the 1st June 1899—	
(1) Orchard...	2,071 1 4
(2) Garden	168 14 0
(3) Potatoes...	1,003 7 6
Total ...	3,243 6 10
Total expenditure from 1st April 1900 to 31st May 1900—	
(1) Orchard...	600 7 0
(2) Garden	.....
(3) Potatoes...	.....
Total ...	600 7 0
Grand Total from 1st June 1899 to 31st May 1900—	
(1) Orchard...	2,671 8 4
(2) Garden	168 14 0
(3) Potatoes...	1,003 7 6
Total ...	3,843 13 10

List of Roses.

Serial No.	Name.	Year.	Serial No.	Name.	Year.
1	Mrs. John Laing	1893	42	Abel Carriere	1895
2	Fisher Holmes		43	A. K. Williams	
3	La France	1894	44	Belle Loyonnaise	
4	No. 245		45	Souviner de Paul Neron ...	
5	Gipsy		46	Andry Schwartz	
6	Baroness Rothschild		47	Madame Willermoz	
7	Reynolds Hole		48	Madame Heppolyte Jamain ...	
8	Paul Neron		49	Perle des Jardines	
9	Geant De Bataille		50	Beauty Inconstante	
10	Glorie de Dijon		51	Madame Carolione Kuster ...	
11	Madame Charles Wood ...		52	Elise Fugier	
12	Dr. Jenner		53	Madame Walch	
13	No. 158		54	Madame Lambard	
14	William Allen Richardson ...		55	Lethe Coles	
15	Marechel Neil		56	Madame Jalcott	
16	Dupuy Jamain		57	Comtesse de Nodaillac ...	
17	No. 326		58	Souvenir de L. A. Prince ...	
18	Madame Pierre Cochet ...		59	Madame Margotine	
19	Captain Christie		60	Ernest Metz	
20	Jean Chespin		61	Sunset	
21	Reine Marie Henriette ...		62	Mde. Charles	
22	John Bright		63	Prince Camille de Rohan ...	
23	Marie Rady		64	L'Ideale	
24	Mde. Boutin		65	Alfred Colomb	
25	Mde. Charles Crakiet		66	Golden Gate	
26	Duc de Rohan		67	Mrs. Robert Garrett	
27	Avocot Duvivier		68	White Bongere	
28	Reve de'Or		69	Bridesmaid	
29	Madame Berard		70	Kaizerien Augustine Victoria ...	
30	General Jacquemenot		71	Mrs. Rumsey	
31	Duke of Edinburgh	1895	72	Charles Gater	
32	Madame Coillot		73	Marchioness of Londonderry ...	
33	Charles Lefebvre		74	Madame Eugine Verdier ...	
34	Marie Baumann		75	Sir Roland Hill	
35	Mde. Victor Verdier		76	White Lady	
36	Etoile de Lyon		77	Clio	
37	President		78	Maman Cocket	
38	Nephitos		79	Margaret Dickson	
39	Leopold Premier		80	Crimson Rambler	
40	Francois Kronler		81	Souvenir d'un Ami	
41	Celine Forestier				

List of Fruit Trees in Orchard, 1899-1900.

Serial No.	Name.	From England.	From Saharanpur.	From Almora.	From grafts, 1895.	From grafts, 1896.	From grafts, 1897.	From grafts, 1898.	From grafts, 1899.	Buds and grafts, 1900. Alive.	Buds and grafts, 1900. Dead.	Total of each.	Total of 1898.	Increase.	Decrease.	Stocks.	Stocks grafted and failed.
	APPLES.																
	Dessert.																
1	Worcester Pearmain ...	11	...	...	...	...	1	8	...	...	...	20	19	1	...		
2	Cornish gilly flower ...	...	...	3	1	2	8	14	3	17	...	48	29	19	...		
3	Sturmer pippin ...	1	...	...	...	...	1	3	1	2	...	8	10	...	2		
4	Duke of Devonshire ...	...	...	...	...	...	1	...	3	1	2	7	6	1	...		
5	Cox's orange pippin ...	5	...	...	...	11	24	69	167	88	18	382	305	77	...		
6	Blenheim orange ...	19	...	...	1	8	10	26	19	17	2	102	104	...	2		
7	Mannington's pearmain...	1	...	...	...	...	2	3	4	5	...	15	11	4	...		
8	Devonshire quarrenden ...	4	...	...	...	...	4	1	...	...	...	9	8	1	...		
9	Syke-house russet ...	...	...	1	...	...	...	3	1	1	...	6	6	...	...		
10	Rebston pippin ...	9	...	...	...	...	3	12	7	10	1	42	40	2	...		
11	King of pippin ...	6	3	...	...	...	5	2	...	...	1	17	17	...	...		
12	The queen ...	12	...	...	1	...	10	14	4	4	...	45	46	...	1		
13	Golden white pearmain ...	3	...	...	...	1	5	5	4	2	1	21	30	...	9		
14	Cockle pippin ...	...	...	2	...	...	...	1	...	...	...	3	3	...	...		
15	Wodhurst pippin ...	...	2	...	...	...	...	3	...	...	...	5	6	...	1		
16	Early harvest ...	...	1	...	...	1	...	11	17	1	...	31	19	12	...		
17	Fairy	...	3	...	11	...	...	2	...	...	...	5	5	...	...		
18	Nonparei	...	...	...	...	1	...	...	2	...	...	3	3	...	...		
19	Golden Reineth ...	...	2	...	...	...	2	3	...	1	...	8	8	...	...		
20	Golden Harvi ...	...	...	...	...	...	...	...	...	...	...	...	1	...	1		
21	Kentish pippin ...	...	3	...	...	...	...	3	...	...	...	6	6	...	...		
22	Melon pippin ...	...	1	...	...	...	...	1	...	...	...	2	4	...	2		
23	Ostin pippin ...	...	2	...	...	...	1	3	28	1	2	37	42	...	5		
24	Francis pippin ...	...	1	...	...	...	...	...	...	...	...	1	1	...	...		
25	Almora No. 1 ...	...	...	2	...	...	...	1	1	...	...	4	12	...	8		
26	Almora No. 3 ...	...	...	...	...	...	1	...	2	...	...	3	1	2	...		
27	Yellow Fugestion ...	5	...	...	...	...	2	2	...	...	...	9	9	...	...		
28	Tyler's Karnel ...	10	...	...	...	...	...	1	1	2	2	16	14	2	...		
29	Gascoigne's seedling ...	5	...	...	...	...	3	3	...	...	...	11	12	...	1		
30	Duchess of Odenburg ...	10	...	...	...	...	...	1	10	1	1	23	42	...	19		
31	Lady Sudely ...	3	...	...	...	...	1	...	...	...	...	4	5	...	1		
32	Golden spire ...	5	...	...	...	...	1	...	...	...	...	6	6	...	...		
33	Beauty of Bath ...	5	...	...	...	...	2	1	...	...	...	8	9	...	1		
34	Irish Peach ...	10	...	...	...	...	1	...	...	...	1	12	12	...	...		
35	Mr. Gladstone ...	5	...	...	...	...	5	...	...	...	...	10	10	...	...		
36	Sandringham ...	5	...	...	...	...	1	2	1	...	...	9	8	1	...		
37	Cornish Armotic ...	...	...	...	...	...	...	...	...	...	...	...	1	...	1		
38	Cox's golden drop ...	...	...	...	...	...	...	2	4	...	...	6	1	5	...		
39	Favourite	...	...	...	...	...	...	...	...	...	...	...	3	...	3		
40	Eastern pippin ...	...	...	...	...	...	...	...	...	...	...	...	2	...	2		
	Cooking.																
41	Rymer	...	...	3	...	1	4	17	2	...	...	27	31	...	4		
42	Bramley's seedling ...	15	...	...	...	...	1	8	2	1	...	27	26	1	...		
43	Hawthornden ...	...	1	1	...	2	2	5	6	3	1	21	30	...	9		
44	Stirling Castle ...	16	...	...	2	...	1	3	...	3	...	25	22	3	...		
45	Dutch mignone ...	...	1	...	...	...	5	2	4	...	1	13	23	...	10		
46	New Northern Greening	1	...	...	...	...	...	2	1	...	...	4	48	...	44		
47	Escheville seedling ...	14	...	...	2	...	15	20	1	9	2	63	77	...	14		
48	Lane's Prince Albert ...	11	...	...	...	...	3	4	2	3	...	23	21	2	...		
49	Dumelow's seedling ...	10	...	...	...	2	27	28	126	137	11	341	70	271	...		
50	Warner's King ...	14	...	...	...	1	14	21	12	29	1	92	59	33	...		
51	Anne Elizabeth ...	7	...	...	...	2	8	10	8	14	1	50	32	18	...		
52	Bess Pool	2	...	...	...	...	...	...	...	...	...	2	2	...	...		
53	Lord Grosvenor ...	10	...	...	...	...	1	1	...	...	...	12	12	...	...		
54	Cox's pomona ...	6	...	...	...	...	2	5	1	9	1	24	16	8	...		
55	Northern Greening ...	...	9	...	...	1	12	14	5	14	...	55	1	54	...		
56	Celine pippin ...	7	...	...	...	...	4	5	5	6	1	28	19	9	...		
57	Newton pippin ...	...	2	...	...	...	3	1	5	...	1	12	14	...	2		
58	New Hawthornden ...	10	...	...	...	...	...	2	...	...	...	12	14	...	2		
59	Peas good nonsuch ...	12	...	...	...	2	5	...	10	14	...	43	31	12	...		
60	Lord Suffield ...	12	...	...	...	4	9	12	8	21	...	66	43	23	...		
61	Granidier	5	...	...	...	...	...	3	...	...	...	8	11	...	3		
62	Gold Medal	7	...	...	...	1	1	...	...	...	...	9	10	...	1		
	Carried over ...	293	31	12	7	40	211	363	477	416	51	1,901	1,488	561	148	...	

List of Fruit Trees in Orchard, 1899-1900—continued.

Serial No.	Name.	From England.	From Saharanpur.	From Almora.	From grafts, 1895.	From grafts, 1896.	From grafts, 1897.	From grafts, 1898.	From grafts, 1899.	Buds and grafts, 1900. Alive.	Buds and grafts, 1900. Dead.	Total of each.	Total, 1898.	Increase.	Decrease.	Stocks.	Stocks grafted and failed.
	Cooking—concld.																
	Brought forward ...	293	31	12	7	40	211	363	477	416	51	1,901	1,488	561	148	...	...
63	Chelmsford wonder ...	5	...	...	...	...	...	...	...	...	...	5	5	...	...	...	...
64	Frogmore prolific ...	5	...	...	...	...	...	...	...	...	...	5	5	...	...	...	...
65	Pott's seedling ...	5	...	...	...	...	...	1	...	...	...	6	6	...	...	...	...
66	Tower of Glaims ...	5	...	...	...	...	...	1	...	...	...	6	6	...	...	...	...
67	Bismark	3	...	...	...	...	...	...	...	...	...	3	3	...	...	...	...
68	Cashmere	...	...	...	...	...	...	1	...	...	1	2	...	2	...	...	...
69	Northern Spy ...	...	...	...	...	...	...	1	...	2	...	3	...	3	...	...	...
	Without Label.																
70	Without label ...	...	...	...	...	...	...	...	...	...	...	18	13	5	...	...	...
71	Stocks	...	...	...	...	...	...	...	...	...	...	...	...	...	...	86	...
72	Stocks grafted and failed	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
	Total ...	316	31	12	7	40	211	367	477	418	52	1,949	1,526	571	148	86	2
	Pears.																
1	Marie Louise ...	6	4	...	5	8	13	9	2	...	2	49	49	...	...	...	...
2	Victoria	...	2	...	2	4	10	3	...	3	...	24	20	4	...	...	...
3	Louise Bonne de Jersey...	13	2	...	4	3	4	6	...	...	...	32	35	...	3	...	...
4	Doyenne du Comice ...	14	...	...	...	...	...	3	...	...	1	18	18	...	...	...	...
5	Glout Morceau ...	9	...	...	1	...	...	...	...	...	...	10	13	...	3	...	...
6	Jargonelle	15	...	...	3	7	40	36	2	1	2	106	114	...	8	...	...
7	Thomsons	...	...	...	...	1	...	...	...	...	...	1	1	...	...	...	...
8	Beurre superfine ...	5	...	...	...	...	6	2	...	...	...	13	16	...	3	...	...
9	Flemish beauty ...	...	2	1	4	1	12	3	...	...	...	23	31	...	8	...	...
10	Pitmaston's Duchess ...	10	...	...	1	2	8	...	2	...	...	23	23	...	...	...	...
11	Easter Beurre ...	12	...	...	...	3	21	13	...	1	1	51	55	...	4	...	...
12	Huyshe's Bergamotte ...	...	2	...	3	5	9	1	...	...	...	20	22	...	2	...	...
13	Bergamotte D'Esperen ...	11	...	...	...	...	5	2	2	...	...	20	18	2	...	...	...
14	Williams' Bon Chretien...	13	...	...	...	...	13	9	1	...	1	37	36	1	...	...	...
15	Winter Nelis ...	7	...	...	...	3	5	6	2	1	...	24	23	1	...	...	...
16	Cattillac	6	...	...	...	...	4	...	...	...	...	10	11	...	1	...	...
17	China	...	1	...	...	...	...	5	...	...	...	6	6	...	...	...	...
18	La Counte	...	25	...	...	...	54	28	4	...	...	111	109	2	...	...	...
19	Kreffer	...	34	...	...	...	63	66	52	9	...	224	194	30	...	...	...
20	Conseiller de la Cour ...	7	...	...	...	...	3	2	...	...	1	15	16	...	1	...	...
21	General Todleben ...	7	...	...	...	1	25	7	...	...	2	42	42	...	...	...	...
22	Beurre Diel	7	...	...	...	2	25	19	...	1	...	54	53	1	...	...	...
23	Revers Fertility ...	7	1	...	...	...	5	...	...	...	...	13	12	1	...	...	...
24	Beurre Hardy ...	9	...	...	...	...	9	4	...	...	...	22	25	...	3	...	...
25	Beurre D'Amanlis ...	11	...	...	...	1	5	2	...	...	...	19	19	...	...	...	...
26	Doyenne du Boussoch ...	6	...	...	...	...	5	4	...	1	1	17	16	1	...	...	...
27	Uvedale St. Germain ...	3	...	...	...	...	1	3	...	...	...	7	9	...	2	...	...
28	Fondante D'Autumn ...	4	...	...	...	...	3	3	1	...	1	12	12	...	...	...	...
29	Beurre Ravee ...	10	...	...	...	...	...	1	...	...	...	11	11	...	...	...	...
30	Duchess D'Angouleme ...	5	...	...	...	...	4	2	...	...	...	11	12	...	1	...	...
31	Beurre D'Aremburg ...	4	...	...	...	...	...	...	...	...	1	5	5	...	...	...	...
32	Hassell	4	...	...	...	...	6	6	...	...	...	16	20	...	4	...	...
33	Brockworth Park ...	4	...	...	...	...	1	2	...	...	...	7	10	...	3	...	...
34	Doyenne D'Ete ...	3	...	...	...	...	...	...	...	...	1	4	3	1	...	...	...
35	Magnate	5	...	...	...	...	1	1	...	...	...	7	8	...	1	...	...
36	Clapp's Favourite ...	11	...	...	...	...	9	1	...	..	1	22	20	2	...	...	...
37	Souverine de Congress ...	4	...	...	...	...	3	3	...	...	2	12	4	8	...	...	...
38	Gratisle of Jersey ...	2	...	...	...	...	3	4	...	...	1	10	16	...	6	...	...
39	Treyve	4	...	...	...	...	7	6	...	...	1	18	20	...	2	...	...
40	Beurre D'Assumption ...	10	...	...	...	...	...	...	...	...	...	10	10	...	...	...	...
41	Comte D'Lamy ...	5	...	...	...	...	3	1	1	...	...	10	8	2	...	...	...
42	Beurre Bachelier ...	3	...	...	...	...	13	9	...	...	1	26	26	...	...	...	...
43	Beurre de Clairgeau ...	2	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...
44	Bavione D'Mello ...	3	...	...	...	...	6	5	...	...	1	15	15	...	...	...	...
	Carried over ...	261	73	1	23	41	406	277	69	17	21	1,189	1,188	56	55	...	...

List of Fruit Trees in Orchard in 1899-1900—continued.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From grafts, 1895.	From grafts, 1896.	From grafts, 1897.	From grafts, 1898.	From grafts, 1899.	Buds and grafts, 1900. Alive.	Buds and grafts, 1900. Dead.	Total of each.	Total, 1898.	Increase.	Decrease.	Stocks.	Stocks grafted and failed.
	Pears—concluded.	261	73	1	23	41	406	277	69	17	21	1,189	1,188	56	55	...	...
	Brought forward ...																
45	Pass Colmar ...	1	...	...	...	...	...	...	...	...	1	2	3	...	1	...	...
46	Beurre capeaumont ...	3	...	...	...	...	...	2	...	...	2	7	8	...	1	...	..
47	Durandean	2	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...
48	Josephine, D'Malenes ...	4	...	...	...	...	2	...	...	...	...	6	4	2	...	...	...
49	Pear without label ...	...	...	...	...	...	...	...	...	...	...	9	10	...	1	...	...
50	Pear stock	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
51	Pear stock grafted and failed.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	271	73	1	23	41	408	279	69	17	24	1,215	1,215	58	58	3	...
	Peaches.																
1	Early river	...	...	6	...	7	5	1	...	...	...	19	20	...	1	...	...
2	Large Agra	...	2	...	...	3	...	...	...	...	...	5	6	...	1	...	...
3	Hardoi	...	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...
4	Violette Hative ...	3	...	...	1	...	...	1	...	...	...	5	5	...	...	...	...
5	Country, No. 2 ...	...	2	...	...	...	...	...	...	...	...	2	2	...	...	...	...
6	Rhenny Shipstone ...	...	...	1	1	1	...	...	...	...	...	3	3	...	...	...	...
7	Dr. Hogg	...	...	2	...	3	...	...	...	...	...	5	5	...	...	...	...
8	Honey	...	...	1	...	4	...	...	...	...	...	5	5	...	...	...	...
9	China flat	...	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...
10	G. Rosse Mignone ...	3	...	...	...	...	...	...	...	...	...	3	3	...	...	...	...
11	Stirting Castle ...	...	...	2	...	1	...	...	...	...	...	3	3	...	...	...	...
12	Anderson's Spring Hill ...	...	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...
13	Early York	...	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...
14	Prince of Wales ...	1	...	...	...	...	...	...	...	...	...	1	2	...	1	...	...
15	Belle Garde	1	...	...	...	...	...	...	...	...	1	2	2	...	...	...	...
16	Alexander Noblesse ...	2	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...
17	Royal George ...	3	...	...	...	...	1	...	1	...	...	5	5	...	..	...	...
18	Peach, Madras ...	...	2	...	6	12	1	5	1	...	3	30	20	10	...	...	...
19	Crimson Galande ...	2	...	...	...	2	1	...	...	...	..	5	8	...	3	...	...
20	Country, No. 1 ...	...	2	...	...	2	..	...	1	1	...	6	5	1	...	...	...
21	Hakim	...	2	...	...	3	...	...	...	...	...	5	5	...	...	...	...
22	Country, No. 3 ...	...	2	...	...	1	...	...	...	...	...	3	4	...	1	...	...
23	Country, No. 4 ...	...	4	...	...	6	...	...	...	..	1	11	11	...	...	...	...
24	Peach stocks... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	Without label ...	...	...	...	...	...	...	...	...	...	...	5	10	...	5	...	...
	Total ...	15	18	14	8	45	8	7	3	1	5	129	130	11	12	...	...
	Apricots.																
1	Hemskirk	4	2	...	...	...	...	...	...	...	...	6	6	...	...	...	...
2	Moore Park	4	3	3	...	4	..	...	1	...	...	15	14	1	...	...	...
3	Large early	3	...	...	...	...	...	...	...	...	...	3	4	...	1	...	...
4	Cashmere	...	2	...	1	1	...	...	...	...	...	4	5	...	1	...	...
5	New large early ...	...	...	2	...	...	...	...	...	...	...	2	2	...	...	...	...
6	Royal	...	...	3	...	3	...	...	...	...	...	6	6	...	...	...	...
7	Brussels	...	...	2	1	...	...	...	...	...	...	3	3	...	...	...	...
8	Early orange ...	...	...	1	...	4	...	...	...	...	...	5	5	...	...	...	...
9	Frogmore early ...	...	...	2	...	...	...	...	...	...	...	2	2	...	...	...	...
10	Golden drops ...	...	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...
11	Mexican	...	2	...	...	...	...	...	...	...	...	2	2	...	...	...	...
12	Without label ...	...	...	...	...	...	...	...	...	...	...	10	10	..	...	...	...
	Total ...	11	10	13	2	12	...	...	1	...	...	59	60	1	2	...	...
	Nectarines.																
1	Claremont	...	3	...	2	15	3	...	...	...	..	23	23	...	...	...	...
2	Kabul	...	2	...	...	1	...	...	...	...	...	3	3	...	...	...	...
3	Murray	...	2	...	...	3	2	...	...	...	...	7	7	...	...	...	...
4	Peach	...	...	...	...	1	...	..	...	...	...	1	1	...	...	...	...
	Carried over ...	...	7	...	2	20	5	...	...	...	...	34	34	...	...	...	...

List of Fruit Trees in Orchard, 1899-1900—continued.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From grafts, 1895.	From grafts, 1896.	From grafts, 1897.	From grafts, 1898.	From grafts, 1899.	Buds and grafts, 1900. Alive.	Buds and grafts, 1900. Dead.	Total of each.	Total, 1898.	Increase.	Decrease.	Stocks.	Stocks grafted and failed.
	Nectarines—concld.																
	Brought forward ...	...	7	...	2	20	5	...	...	...	...	34	34	...	...	...	...
5	Elruge	2	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...
6	Lord Napier ...	2	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...
7	Pitmaston orange ...	3	...	...	1	5	...	...	...	...	...	9	10	...	1	...	...
8	New white	...	3	...	3	12	14	...	...	...	...	32	32	...	...	...	...
9	Hardwick's early ...	5	...	...	...	2	...	...	...	...	...	7	7	...	...	...	...
10	Without label ...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...
	Total ...	12	10	...	6	39	19	...	...	...	...	88	89	...	1	...	...
	Cherries.																
1	May Duke	5	...	...	...	9	3	3	...	...	...	20	20	...	...	...	...
2	Begareau Napoleon ...	4	...	...	...	1	...	1	...	...	..	6	6	...	...	...	...
3	Warder's early black ...	8	...	...	...	6	...	5	...	..	...	19	24	...	5	...	...
4	Begareau	4	...	...	...	8	...	...	...	...	...	12	11	1	...	...	...
5	Kentish	7	...	...	...	10	2	10	...	...	...	29	31	...	2	...	...
6	Knights' early black ...	3	...	...	...	...	2	...	...	...	...	5	5	...	...	...	...
7	Florence	5	...	...	...	...	...	...	1	...	...	6	5	1	...	...	...
8	Morello	3	...	...	...	5	1	2	...	...	1	12	16	...	4	...	...
9	Elton	2	...	...	...	1	..	4	...	...	...	7	8	...	1	...	...
10	Almora No. 207 ...	...	...	2	...	2	...	...	...	...	...	4	4	...	...	...	...
11	Without label ...	...	...	...	...	...	...	...	...	...	...	1	2	...	1	...	...
	Total ...	41	...	2	...	42	8	25	1	...	1	121	132	2	13	...	...
	Plums.																
1	Kabul greengage ...	...	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...
2	Guthrie's late greengage	...	2	...	...	4	1	1	...	...	...	8	10	...	2	...	...
3	Prince Englebert ...	5	...	...	...	1	3	...	...	...	...	9	9	...	...	...	...
4	Rune Claude de Violette	...	2	...	...	...	...	...	...	...	...	2	2	...	...	...	...
5	Jefferson	2	2	...	...	...	...	2	...	...	...	6	8	...	2	...	...
6	Washington	...	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...
7	Victoria	4	...	...	...	3	1	1	...	3	..	12	11	1	...	...	...
8	Early prolific ...	6	2	...	1	8	4	6	3	...	...	30	36	...	6	...	...
9	Alucha, black ...	...	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...
10	Chettenden damson ...	1	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...
11	Black diamond ...	4	1	...	...	...	1	...	...	...	1	7	7	...	...	...	...
12	Cox's golden drop ...	3	3	...	1	1	...	8	1	1	1	19	18	1	...	...	...
13	Early dwarf, yellow ...	...	1	...	...	...	...	..	...	...	...	1	1	...	...	...	...
14	Greengage	3	...	...	...	...	...	4	...	...	...	7	8	...	1	...	...
15	Bruhy's greengage ...	...	...	2	3	...	...	...	...	...	...	5	5	...	...	...	...
16	Smith's purple prolific ...	3	...	...	...	...	...	...	...	...	...	3	3	...	...	...	...
17	Alucha, red	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...
18	Denniston's superb ...	3	...	...	...	...	...	...	...	...	...	3	4	...	1	...	...
19	Golden gage	...	3	...	2	1	1	5	4	4	...	20	18	2	...	...	...
20	Alubukhara, large ...	...	1	...	...	...	...	...	...	...	...	1	6	...	5	...	...
21	Asperie	...	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...
22	Prune	...	1	...	...	4	4	4	4	4	2	23	21	2	...	...	...
23	Alubukhara, small ...	...	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...
24	From tree No. 2, Row No. 1.	...	...	...	...	...	3	...	...	5	1	9	5	4	...	...	...
25	Large yellow ...	...	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...
26	Without label ...	...	...	...	...	...	...	...	...	...	...	10	11	...	1	...	...
27	Plum stock	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...
28	Stocks grafted and failed	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
	Total ...	34	24	2	7	22	18	31	12	17	5	182	191	10	19	7	5

List of Fruit Trees in Orchard, 1899-1900—concluded.

Serial No.	Name.	From England.	From Saharunpur.	From Almora.	From cuttings.	Total of each.	Total 1898.	Increase.	Decrease.	Dead.
	Vine trees Imported.									
1	Black Hamburg	1	...	...	...	1	6	...	5	...
2	Miss Pearson	...	...	...	...	...	1	...	1	...
3	Gross Colmar	...	...	...	...	...	2	...	2	...
4	Muscat Alexandre...	...	...	...	...	...	1	...	1	...
5	Trentham black	...	...	...	...	...	1	...	1	...
6	West St. Peter	...	...	1	...	1	...	1	...	...
7	Red Fruit	...	2	...	...	2	...	2	...	...
8	Nandhari	...	1	...	...	1	...	1	...	...
9	Sp. No. 21	...	1	...	...	1	...	1	...	...
10	Sharbati	...	1	...	...	1	...	1	...	...
11	Sp. No. 18	...	1	...	...	1	...	1	...	...
12	Concord America	...	1	...	...	1	...	1	...	...
13	Muscat rose	...	...	...	...	...	...	...	...	1
14	Hossaini Cabul variety	...	1	...	...	1	...	1	...	...
15	Hossaini	...	1	...	...	1	...	1	...	...
16	Sp. No. 6	...	1	...	...	1	...	1	...	...
17	Madras Field Court	...	1	...	...	1	...	1	...	...
18	Sp. No. 26	...	1	...	...	1	...	1	...	...
19	Muscat Alexunaria	...	...	...	...	...	...	...	...	1
20	Frontignon	...	1	...	...	1	...	1	...	...
21	Gross Colmar	...	1	...	...	1	...	1	...	...
22	Black Alcante	...	1	...	...	1	...	1	...	...
23	Sp. No. 1	...	1	...	...	1	...	1	...	...
24	Buckland sweet water	...	1	...	...	1	...	1	...	...
	Vines raised from seed.									
25	Gross Colmar	...	13	...	...	13	...	13	...	...
26	Alwick seedling	...	8	...	...	8	...	8	...	...
27	Golden Queen	...	20	...	...	20	...	20	...	...
28	Buckland sweet water	...	17	...	...	17	...	17	...	...
29	Foster's seedling	...	9	...	...	9	...	9	...	...
30	Lady Down's seedling	...	3	...	...	3	...	3	...	...
	Total ...	1	87	1	...	89	11	88	10	2
	Figs.									
1	Brown Turkey	5	...	...	13	18	19	...	1	...
2	Large Negro	2	...	...	4	6	6	...	...	...
	Total ...	7	...	...	17	24	25	...	1	...
1	Quince...	...	...	...	...	6	6	...	...	...
2	Mulberry	...	...	...	...	1	1	...	...	...
3	Vacancies	...	...	...	...	83	65	18	...	...
	Currents.									
1	Red Dutch	...	...	...	...	...	1	...	1	...
	Total ...	...	...	...	...	...	1	...	1	...
	Nuts.									
1	Walnuts	...	...	...	...	15	18	...	3	..
2	Cobnuts	...	...	...	...	...	1	...	1	...
3	Filberts	...	...	...	...	1	1	...	...	...
	Total ...	...	...	...	...	16	20	...	4	...

APPENDIX II.

STATEMENT No. I.—*Description of seeds received, together with the cost of consignment and of distribution during the year 1899-1900.*

Seeds.		From	Date of receipt.	Cost of consignment.			Cost of distribution.			Remarks.
Description.	Quantity.			Rs.	A.	P.	Rs.	A.	P.	
Havana and Virginia tobacco seed.	20 lbs.	Messrs. D. Landreth and Sons, Philadelphia, United States of America.	14th July 1899...	172	15	9	9	12	0	
English vegetable seeds.	17 boxes.	Messrs. Sutton and Sons, Reading, England.	7th September 1899.	399	8	0	...			
Eucalyptus seeds	Fourteen packets of 14 varieties.	Secretary, Agri-Horicultural Society, Rangoon.	17th April and 13th December 1899.	2	0	0	...			
Cyphomandra betacea (tree tomato).	4 oz.	Superintendent, Botanical Gardens, Hakgala, Ceylon.	5th September 1899.	...			...			Free.
Ground nut ...	35 bags	Messrs. Gallois, Montbrun and Company, Pondicherry.	16th May 1899	193	10	1	15	6	0	
Sagaing wheat...	25 baskets	Deputy Commissioner, Sagaing.	27th November and 5th June 1899.	93	4	0	5	12	0	
Paddy ...	72 baskets.	Deputy Commissioner, Pegu.	24th April 1899	80	8	0	56	8	0	
Sugarcane and cane-tops.	Twenty canes and 5,545 tops.	Deputy Commissioner, Thatôn.	20th October 1899 and 26th January 1900.	32	7	0	17	4	0	
Potato seeds ...	100 viss	Deputy Commissioner, Upper Chindwin.	.....	20	0	0	...			Local purchase.
		Total ...		994	4	10	104	10	0	

APPENDIX II.

STATEMENT No. II.—*Distribution list of seeds obtained for experimental cultivation during the year 1899-00.*

No.	How distributed.		Tobacco.		English vegetable seeds.		Eucalyptus seeds.		Tree tomato (cyphomandra betacea).		Ground-nut.		Sagaing wheat.		Paddy.		Sugar cane.		Potato seed.		Remarks.
	District.	Designation or name of officer receiving seed.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	Lower Burma.		lbs.		Boxes.		Pkts.		Oz.		Bags.		Bkts.		Bkts.		Cwts.		Viss.		
1	Sandoway ...	Deputy Commissionor	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	5,045	20th October 1899.	...	.....	Cane-tops.
2	Tharrawaddy ...	ditto ...	½	19th July 1899	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
3	Bassein ...	ditto ...	½	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
4	Myaungmya ...	ditto ...	1	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
5	Thôngwa ...	ditto ...	2	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
6	Salween ...	ditto ...	½	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
7	Amherst ...	Secretary, Agri-Horticultural Society.	1	ditto ...	...	.....	...	.....	...	.....	...	.....	10	30th November.	...	.....	...	.....	...	.....	
8	Amherst, Moulmein.	Deputy Commissioner	1	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
9	Thatôn	ditto ...	1	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
10	Tavoy ...	ditto ...	1	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
11	Mergui ...	ditto ...	1	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
12	Thayetmyo ...	ditto ...	½	ditto ...	...	.....	...	.....	...	.....	1	22nd May 1899	...	.....	...	.....	...	.....	...	.....	
	Upper Burma.																				
13	Pakôkku ...	Deputy Commissioner	1	ditto ...	1	21st September 1899.	10	20th December 1899.	...	.....	2	22nd May 1899	...	.....	...	.....	...	.....	...	.....	
14	Minbu ...	ditto ...	1	ditto ...	...	.....	...	.....	...	.....	2	ditto ...	...	.....	...	.....	20	1st January 1890.	...	.....	Twenty sugar canes. Five-hundred cane-tops.
15	Magwe ...	ditto ...	1	ditto ...	...	.....	...	.....	...	.....	2	ditto ...	...	.....	...	.....	500		...	.....	
16	Mandalay ...	ditto ...	½	ditto ...	1	21st September 1899.	...	.....	...	.....	1	ditto ...	...	.....	...	.....	...	.....	...	.....	
17	Bhamo ...	ditto ...	...	.....	1	ditto ...	...	.....	½	8th September 1899.	1	ditto ...	...	.....	...	.....	...	.....	...	.....	
18	Myitkyina ...	ditto ...	½	19th July 1899	2	ditto ...	...	.....	½	ditto ...	1	ditto ...	...	.....	...	.....	...	.....	...	.....	
19	Katha ...	ditto ...	1	ditto ...	1	ditto ...	4	20th April 1899.	3	ditto ...	3	ditto ...	...	.....	72	24th April 1899.	...	.....	...	.....	
20	Ruby Mines ...	ditto ...	...	.....	...	.....	...	.....	...	.....	1	ditto ...	...	.....	...	.....	...	.....	...	.....	
21	Shwebo ...	ditto ...	1	19th July 1899	1	21st September 1899.	...	.....	...	.....	3	ditto ...	15	5th June 1899.	...	.....	...	.....	...	.....	
22	Sagaing ...	ditto ...	1	ditto ...	1	ditto ...	...	.....	...	.....	4	ditto ...	...	.....	...	.....	...	.....	...	.....	
23	Lower Chindwin	ditto ...	...	.....	...	.....	...	.....	...	.....	3	ditto ...	...	.....	...	.....	...	.....	...	.....	
24	Upper Chindwin	ditto ...	...	.....	2	21st September 1899.	...	.....	...	.....	3	ditto ...	...	.....	...	.....	...	.....	100	22nd Aug. 1899.	Local purchase.
25	Meiktila ...	Commissioner ...	...	.....	1	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
26	Meiktila ...	Deputy Commissioner	1	19th July 1899	...	.....	...	.....	...	.....	3	22nd May 1899	...	.....	...	.....	...	.....	...	.....	
27	Yamethin ...	ditto ...	...	.....	...	.....	...	.....	...	.....	2	ditto ...	...	.....	...	.....	...	.....	...	.....	
28	Myingyan ...	ditto ...	½	19th July 1899	1	21st September 1899.	...	.....	...	.....	3	ditto ...	...	.....	...	.....	...	.....	...	.....	
29	Northern Shan States.	Superintendent ...	...	.....	2	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
30	Southern Shan States.	ditto ...	1½	19th July 1899	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
31	Chin Hills, Falam.	Political Officer ...	...	.....	2	21st September 1899.	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
32	Chin Hills, Mindat.	ditto ...	...	.....	1	ditto ...	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	
		Total ...	20	.....	17	.....	14	.....	4	.....	35	.....	25	.....	72	.....	20 canes, 5,545 tops.		100	.....	

APPENDIX II.

STATEMENT No. III.—*Experimental cultivation—Tobacco seed.*

No.	District.	Particulars regarding experiment.	Result of experiment.
			LOWER BURMA.
1	Tharrawaddy	Cultivators on the islands.	The seeds did not germinate. In some cases they were washed away by heavy rains.
2	Bassein ...	Distributed to cultivators through the Subdivisional Officer, Ngathainggyaung.	Failure. Although the cultivators took great interest in the experiment, the young plants were destroyed by heavy rainfall.
3	Myaungmya	Distributed to six persons in the Pantanaw township for trial on alluvial land.	Only one experiment was fairly successful.
4	Thôngwa ...	Distributed to *kaing* cultivators through the Inspectors of Land Records, Danubyu, Yandoon, and Ma-ubin townships.	In Danubyu and Yandoon townships the experiments proved a great success. The experimentors are highly pleased with the results obtained, and they state that they will plant extensively next season with the seeds gathered this year. The crop is superior than that of the local Burmese tobacco, and the local value which prevailed is from Rs. 60 to Rs. 70. Sample of leaves from Yandoon township is forwarded for inspection. A native of India was most successful with the seed. In Ma-ubin the experiment proved a failure. The failure is attributed to lateness in sowing and want of experience on the part of cultivators.
5	Salween ...	Distributed to Thugyis	Failure, owing to unsuitable soil.
6	Amherst ...	Distributed to cultivators through Township Officers.	In Moulmein township the experiment proved a success at Kado, but in other townships it has failed completely. The successful tobacco sold for Re. 1 per viss.
7	Amherst (Moulmein). ...	Secretary, Agri-Horticultural Society.	Report not received.
8	Thatôn ...	Distributed to cultivators through Subdivisional and Township Officers.	Owing to unsuitable soil the experiment failed in the Thatôn and Martaban townships, and also in the Paan subdivision; but proved a great success in Kyaikto and Belin townships, the outturn obtained being about 400 lbs.
9	Tavoy ...	Distributed to Thugyis and *ywathugyis* through Township Officers.	The experiment was fairly successful in the Northern township and produced about 8 viss of tobacco, but in others it proved a failure. The failure in two townships is attributed to want of dew and poverty of the soil.
10	Mergui ...	.....	Report not received.
11	Thayetmyo ...	Distributed to the Subdivisional Officers, Thayetmyo and Myedè.	Failure, owing to want of moisture and the attacks of insects.
			UPPER BURMA.
12	Pakôkku ...	Distributed to Thugyis in the Pakôkku and Yesagyo townships.	The experiment failed in Pakôkku. In Yesagyo the experiment was a partial success, but is said to be of doubtful utility.
13	Minbu ...	Grown on *kaing* land. Not manured. Planted in November.	The experiment was made at Sagu township and proved a success in one case.
14	Magwe ...	Distributed to the Township Officers, Magwe, Myingun and Taungdwingyi.	The experiments failed in Myingun owing to a rise of the river. In the other two townships the leaves are said to have withered.
15	Mandalay ...	Madaya township ...	The experiment proved a failure owing to excessive rains.
16	Myitkyina ...	.....	The experiments made at riverine villages were successful, but failed in other places as the seeds did not germinate.
17	Katha ...	.....	In most cases the seeds did not germinate, and in others the young plants were destroyed by an untimely rise of the river.
18	Shwebo ...	Distributed to the Subdivisional Officers, Shwebo, Ye-u, and Tantabin.	The experiment was fairly successful in Taze and Mayagan townships, and poor results were also obtained from Sheinmaga and Kanbalu; elsewhere the plants entirely failed owing to want of rain.
19	Sagaing ...	.....	The experiment proved a total failure, owing to want of attention.
20	Meiktila ...	.....	Report not received.
21	Myingyan ...	Distributed to cultivators on the islands in the Irrawaddy.	The experiment proved a failure owing to a rise of the river shortly after the seeds were sown.
22	Southern Shan States.	Distributed to the Mongnai *Sawbwa*, and the Chiefs of Nyaungywe and Sagu States.	Failure. In most cases the seeds failed to germinate; and that where germinated the young plants were destroyed by heavy rains

APPENDIX II—STATEMENT IV.

Result of English vegetable seed experiments.

District.	Cabbage.	Cauliflower.	Radish.	Carrot.	Turnip.	Khol Rabi.	Beet.	Tomatoes.	Peas.	Beans.	Lettuce.	Celery.	Onions.	Asparagus.	Reasons for failure.
Pakôkku ...	S1	...	S3	S2	S1	S1	...	S1	S2	S1	S3	...	S1	...	Late sowing.
Mandalay ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Heavy rainfall.
Bhamo ...	S1	...	S1	S1	S1	...	S1	S1	S2	S2	S2	...	...	...	Attacks of insects.
Myitkyina ...	...	S2	S	S	...	...	...	...	S	S	S	...	...	S	Insufficient water-supply.
Katha ...	...	...	S	...	S	...	...	...	...	...	...	S	S	S	Want of attention.
Shwebo ...	...	...	...	...	...	S	S	S	...	...	...	...	...	...	Ignorance, indifference, and unsuitable soil.
Sagaing ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Heavy rains and bad selection of ground.
Upper Chindwin.	S	S	S	S	S	S	S	S	S	S	S	S	...	...	Want of care and heavy rains.
Meiktila ...	S2	S2	S2	S1	S2	S1	...	...	S1	S2	S2	S2	...	S2	Heavy rains.
Myingyan ...	S	...	...	S	...	S	...	...	...	...	...	...	...	...	No reasons were given.
Northern Shan States.	S	...	S	S	S	S	S	S	S	S	S	S	...	...	Late sowing and attacks of insects.
Chin Hills (Falam).	S2	...	S1	S1	S1	S1	...	S1	...	...	S1	...	S1	...	No reasons were given.
Chin Hills (Mindat).	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Report not received.

N.B.—The blanks represent failures, the letter S stands for a successful experiment, and, where the experiment has been tried in two or three different places, the numerals show the number of successful experiments.

STATEMENT No. V.—*Experimental cultivation.—Ground-nut.*

No.	District.	Particulars regarding experiment.	Result of experiment.
			LOWER BURMA.
1	Thayetmyo ...	Distributed to the Subdivisional Officers, Thayetmyo and Minhla. The seeds were sown in September and the nuts gathered in January.	Failed owing to want of moisture, except in Kyauk Saung San village, where the 4¾ lbs. of seed gave an outturn of 109½ lbs. of nuts.
			UPPER BURMA.
2	Pakôkku ...	Distributed through the circle thugyis. The seeds were sown in September and the nuts gathered in February.	Failed except in Myaing township, where about 8 baskets of ground-nuts were obtained.
3	Minbu ...	Distributed to Revenue surveyors.	As the seeds were injured by insects, about 10 per cent. of the seeds did not germinate. The seed was planted late and did not give good results.
4	Magwe ...	Township Officers distributed the seed to cultivators.	Failed owing to destruction by rats in Myothit owing to late sowing in Natmauk. The seed did not germinate in Taungdwingyi.
5	Mandalay ...	ditto ...	Failed. The failure is attributed to heavy rains and unsuitable soil.
6	Bhamo ...	Experiments made in three villages. The seeds were sown in June and the nuts gathered in January.	In two villages the plant was totally destroyed by floods, but in the other (Yogyi village) it proved successful and 4 lbs. of seed yielded about 128 lbs. of nuts.
7	Myitkyina ...	Distributed to the Subdivisional Officers, Myitkyina and Mogaung, and the seeds were sown in June.	The experiments failed in both places owing to the soil being too damp and cold and to heavy rainfall.

No.	District.	Particulars regarding experiment.	Result of experiment.
8	Katha ...	.....	As the cultivators took no interest in the experiment it proved a failure.
9	Ruby Mines	Distributed to the Subdivisional Officers, Tagaung, Momeik, and Mogôk.	Failure owing to excessive rains and unsuitable climate and soil.
10	Shwebo ...	Distributed to the Subdivisional Officers, Shwebo and Ye-u. The seeds were sown in September and planted out in November.	Failed, except in Mayagan township of the Ye-u subdivision where the experiment was a success. The failure is attributed to heavy rains and unsuitable soil.
11	Sagaing ...	Distributed to cultivators through Subdivisional Officers.	The experiments proved a failure in every case owing to the seed being too old for cultivation.
12	Lower Chindwin.	Distributed to the Subdivisional Officers, Palè and Budalin.	The experiment failed in every case as the people did not appreciate its cultivation and the soil and climate is said to be unsuitable.
13	Upper Chindwin.	.....	The experiment proved a perfect failure.
14	Meiktila ...	Distributed through Subdivisional and Township Officers.	Most of the experiments failed owing to heavy rains. In some cases the plants came up, but were destroyed by insects.
15	Yamèthin ...	.....	The experiments were made in five villages. In Kyette the insects destroyed the seed. In Zidaw, Monangôn and Pettaw the seeds were swept away by flood. In Badda the soil being unfavourable the outturn was only 3½ baskets.
16	Myingyan ...	Distributed to the Subdivisional Officers, Myingyan and Pagan. The seed was sown in June and the nuts gathered in December.	In Myingyan the experiment proved a success. In Pagan the experiment failed, although due care was taken in the cultivation.

G. B. C. P. O.—No. 43, D., L., R. & A., 8-11-1900—247.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

FOR THE YEAR 1900-1901.

RANGOON: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, BURMA. JANUARY 1902.

[Price,—Re. 0-7-0 = 8d.]

TABLE OF CONTENTS.

REPORT ON THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BURMA, FOR THE YEAR 1900-1901.

SECTION I.

Prefatory.

	Para.	Page.
Administration of the department...	1	1

SECTION II.

Land Records Establishment.

Work of the Land Records establishment	2	1

SECTION III.

Utilisation of Land Records.

Nothing new to record	3	1

SECTION IV.

Scientific and National Enquiry under Imperial Control.

Economic products collected	4	1
Work of the Civil Veterinary Department	5	ib.

SECTION V.

Scientific and Local Enquiry under Provincial Control.

No scientific or local enquiries conducted	6	2
Experimental gardens	7	ib.
Distribution of seed	8	ib.
Sugar-cane, plantain, paddy, &c.	9	ib.
Tobacco	10	ib.
English vegetable seeds	11	ib.
Ground-nut	12	ib.
Australian Salt (Bush Atriplex Nummularia)	13	3
Paspalum Dilatatum	14	ib.
Eucalyptus Citriodora	15	ib.
Tree tomato	16	ib.
Tea seed	17	ib.
Sugar-cane	18	ib.
Paddy	19	ib.
Plantains	20	ib.
Potato	21	ib.

SECTION VI.

Agricultural Education.

Nothing new attempted	22	3

SECTION VII.

Publication of Agricultural Information.

Amended Burma Famine Code	23	3

SECTION VIII.

Final.

Nil.

REPORT

ON THE DEPARTMENT OF

LAND RECORDS AND AGRICULTURE, BURMA,

FOR THE YEAR 1900-1901.

SECTION I.

PREFATORY.

THE Director took no leave during the year; the Assistant Director was absent on privilege leave for 40 days.

The Assistant Director gave me great assistance in looking after the large number of revision surveys in progress during the year. The usual amount of inspection work was performed by the Director and Assistant Director.

SECTION II.

LAND RECORDS ESTABLISHMENTS.

2. The work of the land records establishments is dealt with in the Revenue Administration Report. The establishments sanctioned in the districts of Upper Burma are said to be insufficient and there is a delay in the submission of assessment rolls. The question is being considered with regard to the wants of each district.

SECTION III.

UTILIZATION OF LAND RECORDS.

3. There is nothing new to record under this head in addition to that given in other reports.

SECTION IV.

SCIENTIFIC AND NATIONAL ENQUIRY UNDER IMPERIAL CONTROL.

4. The statement in Appendix I gives the list of economic products collected for the Reporter on Economic Products during the year. Enquiries have also been carried out as to the cultivation of the "Goa bean" in Burma, and as to the bark of a tree that is manufactured into paper and exported into China from the Myitkyina district. Instructions for the collection, preservation, and packing of botanical specimens have been translated into Burmese and circulated. Collector's note books with foil numbers have also been distributed. It is hoped that in this way better specimens will be procured and more interest taken in their collection. I have to thank District Officers and the Conservators of Forests for the assistance they have given. Some interesting specimens and information were also supplied from the Southern Shan States. Appendix I.

5. The Civil Veterinary Department's report has been submitted. The Frontier Trade Report and the Rainfall Registration Report were re-written by the Financial Commissioner and are now in the press. The two statistical reports have not yet been taken in hand.

SECTION V.

SCIENTIFIC AND LOCAL ENQUIRY UNDER PROVINCIAL CONTROL.

6. Beyond experimental gardens and the distribution of seed, no scientific or local enquiries have been conducted and there is no establishment for the purpose.

Appendix II. Reports I, II, III, IV.

7. *Experimental gardens.*—The reports received from the Deputy Commissioners, Bhamo and Myitkyina, on the experimental gardens in their districts, and from the Superintendent, Chin Hills, and on the Taunggyi gardens and orchard from the Superintendent of the Southern Shan States are printed and published in the Appendix. The request of the Superintendent, Chin Hills, has been noted.

Appendix III. No. I.

8. *Distribution of seed.*—The expenditure incurred on the purchase and distribution of seed amounted to Rs. 1,072.

Appendix III. No. II.

9. In the case of sugar-cane, plantain, paddy and potatoes the seed was obtained locally. Havana tobacco was distributed in Lower Burma and Virginia in Upper Burma.

Appendix III. No. III.

10. *Tobacco.*—The most successful result was obtained in Yandoon, Thôngwa district. One pound of seed on the bank of the Irrawaddy produced 3,650 lbs. of tobacco on 3·15 acres. In this subdivision the cultivation of tobacco is assuming important dimensions and efforts are made to cure the tobacco. The Havana leaf is apparently not so appreciated as the Virginia. The price, however, obtained was higher than that for tobacco grown from local seed. In Bilin, Thatôn district, half a pound of seed gave 125 viss, valued at Re. 1 per viss. A small success was obtained in Monan-auk-Paingkyôn. In Myitkyina 1,060 lbs. of tobacco was obtained from about 1 lb. of seed and valued at Rs. 167. In other districts the experiments were generally a failure. Tazè township seems suitable for its cultivation and in Shwebo and in Ramree township, Kyaukpyu and Rathedaung township, Akyab, some degree of success was attained. Generally, the experiments have failed from a bad selection of soil, or carelessness at the time of sowing and planting. The experiments were as a rule conducted on alluvial soil and there seems no doubt that the Havana or Virginia tobacco will grow as well as the local variety if it is properly cared for. Where it has been extensively successful the leaf is considered of better flavour and texture than the local variety and fetches a higher price.

Appendix III. Statement IV.

11. *English vegetable seeds.*—These seeds have been distributed as usual and most of them have been a success when carefully tended. In Meiktila, Bhamo and Katha the seeds gave good crops. In the Northern Shan States a Chinaman was most successful. Shans only care about tomatoes, which sell at 8 annas a viss. A new garden was started as close to water as possible, but the ground was new. It is a pity that experiments on a larger scale cannot be conducted in the Northern Shan States.

Appendix III. Statement V.

12. *Ground-nut.*—The greatest success was obtained by Maung Ba Thaw, *Akunwun*, Myingyan, in his garden at Thèbyuwa. The land on which the nuts were planted measures 1·23 acres, and is often flooded by the Irrawaddy, but this year it escaped. Eighty pounds of seed were planted on 1st June in rows one foot apart and produced 2,570 pounds in December. The price was said to be Rs. 1-12-0 per basket of 32 pounds. The experimentor comparing *pègya* and ground-nut, which will grow on land that suits *pègya*, states, "Ground-nut gives an outturn of about 60 baskets to the acre and *pègya* only 25 baskets. Ground-nut fetches Rs. 1-12-0 per basket, while *pègya* can only be sold at the rate of Re. 1 per basket." He has kept seed for next year, and cultivators round are asking for seed, which I hope to supply them. Both here and in Bhamo it is noted that the nut is superior to the thick-shelled nut imported from the Shan States. It would, perhaps, be worth the while of the Superintendents to consider the advantages of importing fresh seed into the States. In Kyaukpadaung, Myingyan district, the crop was damaged by heavy rain, 70 pounds of seed sown in June produced 201 pounds. In Minbu the seed was sown in July and 148 pounds gave an outturn of 920 pounds in one plot of ·36 of an acre in Sagu, and an outturn of

690 pounds on ·28 of an acre in another plot. The price quoted was Rs. 1-8-0 per basket. In Bhamo 198 pounds of seed were planted in July on reddish-brown loamy soil in furrows 20 inches apart. The crop obtained was 4,752 pounds and valued at Rs. 1-12-0 per 44 pounds. Minor success was obtained in one case each in the Ruby Mines, Sagaing, Lower Chindwin and Meiktila. Elsewhere the experiment was a failure.

13. *Australian Salt Bush—Atriplex Nummularia.*—One pound each of the large and small variety was experimented with in six places in Myingyan in September, but the seed failed to germinate, despite of the great care taken. An experiment on a larger scale is being now conducted in more districts. The seed was supplied before the rains broke.

14. *Paspalum Dilatatum.*—No seed was procurable last year, but seed has been distributed this year.

15. *Eucalyptus Citriodora.*—Plants in the Jail Garden in Katha are six inches to one foot high and are doing well. The rest have not been reported on.

16. *Tree tomato.*—The experiment has proved a failure in Katha.

17. *Tea seed* is referred to by the Superintendent, Southern Shan States, in his report on the Taunggyi garden.

18. *Sugar-cane.*—In Sandoway of the cane-tops supplied only about 25 per cent. were productive. In Minbu the Burmans take no interest in the experiment, and a Chinaman obtained 250 canes out of 50 tops supplied; 200 canes sold for Rs. 19. The juice was said to be slightly bitter owing to a taint in the soil.

19. *Paddy.*—The seed of the *kaukngè* variety supplied from Prome to the Katha district was successful in two cases, but failed elsewhere.

20. *Plantains.*—Out of 100 shoots of the *nanthabu* variety supplied from Bassein to Minbu 87 are doing well.

21. *Potato.*—The experiment in the Upper Chindwin was a failure. It is said that the seed by the Shwebo Jail was of inferior quality. In the Chin Hills the potatoes sent have done well at Falam. In Katha the potato seed sent was a success in Katha and Mawlu townships, but failed elsewhere. On inundated alluvial soil, one acre in extent, 80 viss planted in October gave 800 viss in March. The crop was valued at four annas a viss.

SECTION VI.

AGRICULTURAL EDUCATION.

22. Nothing new has been attempted by this department.

SECTION VII.

PUBLICATION OF AGRICULTURAL INFORMATION.

23. The amended Burma Famine Code has not yet received the sanction of Government pending the result of the labours of the Famine Commission.

The usual periodical reports and the forecasts of the rice and cotton crop have been duly published. A supplementary forecast of the rice crop was published in April in order to supply the latest information to the public concerning the damage done by the rains in February.

SECTION VIII.

FINAL.

Nil.

A. GAITSKELL,

Director of Land Records and Agriculture, Burma.

APPENDICES.

	Page.
APPENDIX I.—List of economic products sent for the Indian Museum and Imperial Institute	7
APPENDIX II.—Reports on experimental gardens—	
I.—Myitkyina district	7
II.—Bhamo district	ib
III.—Sintemgaba	9
IV.—Chin Hills	12
V.—Southern Shan States	14
APPENDIX III.—Experimental cultivation—	
I.—Description of seed	22
II.—Distribution of seed	ib
III.—Tobacco seed	23
IV.—English vegetable seeds	24
V.—Groundnut seed	25

APPENDIX I.

Economic Products sent for the Indian Museum, Calcutta, and Imperial Institute, London, during 1900-1901.

Name.	Description of specimen sent.	From where obtained.
(i) Ananus Sativa ...	Preserved fruit and botanical specimens.	Amherst and Hanthawaddy.
(ii) Aleurites Moluccana ...	Twigs, leaves, dry nuts and botanical specimens.	Minbu division and Southern Shan States.
(iii) Baccaurea Sapida ...	Seeds, leaves and botanical specimens.	Conservator of Forests, Tenasserim Circle.
(iv) Bonea Burmanica Maricum or *Mayan*.	Green and ripe fruits, salted and preserved leaves and flowers.	Conservator of Forests, Pegu Circle.
(v) Coix Lacrima Jobi ...	Plants, roots, seeds and fruits of edible, non-edible and odorous varieties.	Thatôn, Mergui, Meiktila division, Southern Shan States and Karenni.
(vi) Cyometra Ranuflora (*Myinkabôn*).	Wood, bark, roots, leaves, fruits and seeds.	Amherst, Upper Chindwin, Ruby Mines.
(vii) Dioscora (yams) ...	Tubers, live tubers. Botanical specimens of wild, cultivated indigenous or exotic in various forms.	Kéngtông; Sagaing, Mergui, Sandoway, Toungoo, Myitkyina, Bassein, Henzada, and Kyauksè districts; Minbu and Meiktila Divisions, Southern Shan States, Thôngwa, Northern Arakan, and Prome.
(viii) Gynocardia Ordorata	Seeds, leaves, fruits, bark and roots.	Pegu Forest division, Tharrawaddy Forest division, Upper Chindwin Forest division, Northern Forest circle, Mandalay, Southern Forest circle, Shwegyin Forest division, Ataran Forest division, Rangoon Forest division.
(ix) Oryza Sativa Oryza coaxlata.	Flowers, plant, gram, &c. ...	Amherst, Hanthawaddy, Akyab, Pegu and Bassein.
(x) Thespesia Lampas ...	Dry flowers and botanical specimens.	Toungoo Forest division, Tharrawaddy Forest division, Tavoy Forest division, Rangoon Forest division, Tenasserim Forest circle.

APPENDIX II.

REPORT ON EXPERIMENTAL GARDENING IN THE MYITKYINA DISTRICT FOR THE YEAR 1900-1901.

THREE gardens are sanctioned in this district—at Myitkyina, at Sima, and at Sadôn. The expenditure on them was as follows: Myitkyina Rs. 445-6-0, Sadôn Rs. 163-6-0, Sima Rs. 75-10 0. There were no receipts. The gardens, except for a few vegetables, are not yet productive. There is no sale for vegetables at Sadôn and Sima, and at Myitkyina the little demand there is, is supplied from the gardens of natives of India in the neighbouring villages, to whom English vegetable seeds are distributed. The sum of Rs. 45 was obtained by the gardener at Myitkyina by sale of vegetables, but has only now been credited.

Myitkyina garden.—This was started on the 1st September 1900. About an acre and a half of land near the river-bank was cleared of trees and long grass, fenced in, and ploughed. This took some time and the soil was not ready for planting until November. The common English vegetable seeds were then sown. Peas, beans, cabbages, and tomatoes did fairly well, but, owing to the great damage done to them by insects (chiefly crickets, Burmese *payit*) and the fact that they had been put down too late, the cultivation was far from successful. There is no doubt English vegetables will grow well at Myitkyina and better results may be expected this year.

The following trees were ordered from the Government gardens, Saharanpur, and were received on 12th January 1901:—

Four apricot.	Eight lichi.	Four plum.
Six lime.	Four orange.	Four pomelo.
Four lemon.	Twenty peach.	Twelve eucalyptus.

All the eucalyptus and five of the lichi plants have died, but all the others are doing well, the peaches especially making very strong growth.

Two hundred strawberry plants were received from the Superintendent, Southern Shan States, on 2nd January and were planted at once. A few fruits only ripened, but an excellent crop of strawberries was obtained from plants put down in a private garden in the previous June, and I have no doubt the plants in the Government garden will do equally well next year.

On the whole, the garden has made a fair start, but the expenditure must be increased if good results are to be obtained. At present only one gardener at Rs. 15 is sanctioned, but an experienced man at Rs. 30 or Rs. 40 is required. It is also necessary to make some arrangement for pumping water up from the river. The Executive Engineer has promised to assist me in this matter and states that about Rs. 250 will be required.

Sima garden.—Experimental gardening was started here in 1897 and has been carried on in a desultory fashion since. It is impossible to obtain a good gardener for such an out-of-the-way place, and only a sepoy on Rs. 5 per mensem besides his pay has been paid by Government, though the Assistant Commandant has generally employed an extra hand at his own expense. Owing to there being no Civil Officer at Sima previous to the present season and to the fact that Assistant Commandants are frequently changed, it has been difficult to get any one to take an interest in this garden. The present Assistant Commandant, Captain J. Whitehead, however, has done much for the garden and his report is worth quoting in full.

Situation.—The garden is divided into two portions by a deep nullah running east and west. The part north of the nullah is deep and worked in terraces; the southern part is on a gentle slope. The site is on the whole favourable and will be improved as the surrounding jungle is cleared.

Soil.—A good deep loam mixed with leaf-mould, except here and there where there are patches of red clay.

Water.—The supply is sufficient and constant from two springs, the water from which is brought into the garden in bamboo pipes and collected in various small wells.

Manure—is hard to procure in sufficient quantities.

Labour.—Two military police sepoys are employed. They worked hard, but are quite unskilled; success in the garden therefore depends on the presence in Sima of either a Civil Officer or Military Police Officer who happens to be interested in horticulture.

Insects.—White ants and red do much damage to roots. Caterpillars attack tomatoes when fruiting and growing cabbages, &c.

Birds.—There are very few small birds to mitigate the insect nuisance. The common bulbul is destructive to strawberries and tomatoes.

Gnats attack cabbages, cauliflowers, and all roots, especially beet-roots.

I arrived in Sima in the middle of November 1900 and began gardening at once. At the time of my arrival there were in the garden about ten fruit-trees (peach, nectarine, apple, plum and apricot; of these only two peaches were healthy), some young fruit-trees of different sorts, strawberry beds (indifferently looked after), some cabbages, broccoli, turnips, carrots, and a small bed of asparagus, also two beds of mint.

Since November I have sown the following, with the results noted (the seed being nearly all Sutton's) :—

Asparagus.—Did not germinate very well, but young plants are healthy.

Beans, Canadian Wonder.—Those sown in December were not a great success owing to exposure to the cold. Later sowings produced large, well flavoured beans extraordinary profusely.

Beans, broad.—Had only very few seeds; these all germinated, and I have just begun picking; the pods are numerous and well-filled.

Beet.—Not large, but of excellent flavour.

Broccoli, cabbage, and cauliflower.—Have all done well.

Carrots.—Very good

Celery.—I sowed in February and again in April. The February sowings, after a transplant, were put out in trenches on the 28th May. The plants are very healthy. It remains to be seen how they will stand the rains; the trenches having a good slope, they may escape rotting.

Mustard and cress.—Very good.

Lettuces.—Very good, and cabbage variety most excellent.

Knol-khol.—Good, but specially attacked at the roots by small red-ants.

Onions.—Did not germinate well, but such as came up look well.

Peas.—Four varieties sown—"Ringleader," "Duke of Albany," "Abundance," and "Fortyfold." Of these, the three first have done very well, the last podded badly and the pods were ill-filled. A late sowing of "Abundance" is just coming into flower, but will, I expect, be spoiled by the rain. "Duke of Albany" has enormous pods.

Radishes.—The long varieties do excellently, but three sowings of the turnip varieties were very poor.

Spinach.—Moderately successful.

Tomato.—Grows most vigorously, but the crop has been decimated by caterpillars that eat into the fruit.

Turnips.—Flourish, but are subject to attacks of ants at the roots.

Vegetable marrow.—Sown in February; has borne very profusely.

Besides most of the above in various stages, there are now in the garden cucumber, Scotch kale, and curled cabbage. It is doubtful what effect the rains will have, but I fear many things will rot off, unless we get more than the usual amount of sunshine.

Potatoes.—A few were put in at the end of December; the crop, which was only moderate, had to be dug before it was ready owing to the attacks of white ants. A second sowing of about 17 viss in February has been most successful up to date; if we get a few day's sunshine, when the crop is ready for digging, this sowing should give very good results.

Strawberries.—The beds have been much neglected, but there has been a small quantity of fruit from December up to now. With care this fruit should do extremely well.

Fruit-trees.—Besides those already mentioned, I received a fresh supply of 20 saplings (peach, apricot, lime, and orange); these, except the apricots, are making good growth. Of the older trees, two peaches are full of fruits, but they are not yet ripe and many of the fruits are splitting, owing, I imagine, to heavy rain after prolonged sunshine.

The experience of the last seven months justifies the belief that all the commoner English vegetables will flourish in Sima throughout the cold and hot weather. It remains to be seen what kinds will repay growing during the rains. There is no demand for the product of the garden amongst the Kachins, but the sepoys of the garrison are always glad of any. The sepoys have some small gardens, in which they grow principally Indian-corn and a large-leaved kind of mustard called by the Kachins *ching-keen.* They also grow various kinds of pumpkins.

Sadôn garden.—Suffers under the same disabilities as the Sima garden and can only progress when there is an Assistant Commandant there who takes an interest in gardening. The first garden started in 1897 was unfortunately placed on the northern face of the hill and, receiving too little sun and too much wind, little would grow there. A garden has now been laid out on the south of the hill; the fruit trees were transplanted, but few survived the operation. The following fruit-tree saplings were sent to Sadôn last January, namely, five apricot, two lime, two nectarine, three orange, and ten peach. Two apricots, one nectarine, and one lime have failed; the rest are all doing very well. The Assistant Commandant has asked for apples and pears to be sent him as the wild species is indigenous in these hills and cultivated kinds will probably grow well. These, as well as plums and greengages, will be sent next season.

Strawberry plants received from Taunggyi in January 1900 bore a fair crop in April of the same year. This year there has been a magnificent crop of strawberries and the Assistant Commandant is extending the cultivation. A severe storm towards the end of April did considerable damage to the plants, but they bore a second crop at the end of May.

A few English vegetable seeds were supplied to this garden, and beetroot, tomatoes, cabbage, carrots, artichokes, cauliflower, broccoli, asparagus, onions, radish, turnips, and lettuce all did well. The Assistant Commandant is sowing his own seed this year. From 1st July an unattached Gurkha who could give his undivided attention to the garden was engaged; up to that time the work of the garden had been done by a Gurkha sepoy on a gratuity of Rs. 5 per mensem.

General.—As I have said above, the success of these gardens depends entirely on the officers in charge of them. The officers at Sima and Sadôn both have a good knowledge of gardening and both are likely to remain for another season at least; the gardens have now made a good start and I think the experiments should be continued. There is no likelihood of the gardens being remunerative for several years, but the expense is at present small.

E. C. TOWNSEND, CAPT.,
Deputy Commissioner, Myitkyina.

REPORT ON EXPERIMENTAL ORCHARD AT SINLUMGABA FOR THE YEAR 1900-1901

1. The grant for the year under report was Rs. 3,400. This amount, as will be seen from the details given in Statement B, proved to be more than could be spent. In future I think it would be advisable to curtail the grant by Rs. 500 as the garden is now sufficiently large and any enlargement would only increase the already difficult question of a sufficient water-supply.

2. *Expenditure.*—The total under this head was Rs. 3,400. Of this sum, Rs. 2,723-15-11 only were spent, showing a saving of Rs. 676-0-1.

3 *Receipts.*—As there is no large market for the disposal of vegetables and such perishable fruit as strawberries, which are commodities of quick growth and rapid returns, the amount realized was the small sum of Rs. 15-9-3. The vegetable and fruit (strawberries) which realized this sum were sold to the men of the military police stationed here and to a few European visitors.

4. *Work for the year.*—During the rains the garden was kept free from weeds, and old stumps were grubbed up. For the latter work, which is both hard and tedious, coolies were employed to assist the regular garden-hands.

There were purchased during June and July the following number of indigenous fruit-trees for grafting purposes:—

	Trees
Apples, wild	52
Apricots, wild	12
Pears, wild	2
Cherries, wild	230
Quince	67

Late in February and early in March grafting was done on these stocks and the results obtained were as follows:—

Cherries	138 grafted. 83 succeeded. 55 failed.
Apples	14 grafted. 1 succeeded. 13 failed.
Pears	19 grafted. 4 succeeded. 15 failed.
Peaches	12 grafted. 12 failed.
Plums	12 grafted. 12 failed.

The percentage should have been greater, but the head gardener stupidly allowed the cord which is used in binding the scion to the stock to cut so deeply into the latter as to prevent the sap moving freely up the tree. I was absent while these operations were being carried out and only arrived back just in time to save what would otherwise have been a total failure.

In the wet weather grafting by inarching was tried, but the results were unsatisfactory and I ascribed this to the strong wind which sweeps over the garden at all times of the year, as the slightest friction caused between the stock and the scion invariably results in the latter withering. Even after the operation has proved successful a strong gust of wind is liable to cause a displacement. In November a consignment of fruit trees was received from Messrs. Low and Company, Middlesex:—

	Trees.
Plums	36
Apricots	11
Pears	62
Cherries	18
Apples	42
Currants	86
Figs	2
Walnuts	54

These were planted out on the 3rd and 4th January 1901 at an average distance of 20 feet. The plants arrived in excellent condition and are now doing well. A parcel of Spanish chestnuts were also received in March; some were planted in boxes at Bhamo by the Deputy Commissioner and the rest have been put into beds here. The former have made good growth and are now some 10 inches high, but the latter have up to the moment of writing shown no signs of moving.

5. *Vegetable garden.*—There has been considerable improvement in this branch of the garden. Cauliflowers, turnips, carrots, beet, and radishes were quite up to the mark, but cabbages for some unexplainable reason failed.

Melons, squashes, vegetable marrows, and globe artichokes are growing strong and, if an excess of rain does not injure them, the result should be good.

Tubers.—Late in February a consignment of potatoes and artichoke tubers arrived from Bhamo. They were at once planted in drills about 2 feet apart and in loose moist soil. The potatoes are very nearly ready and I expect to get a really good crop. The artichokes have not done well; in fact the majority have not yet shown any signs of growing. As soon as the potato crop is gathered, I shall distribute the tubers among the neighbouring chiefs and will at the same time impress upon them the benefits to be derived from the cultivation of this readily marketable product.

Early in the rains I also planted a small indigenous tuber known in the vernacular as *paipothi*. They are easy of cultivation and strike readily from both cuttings and tubers. As suggested by the vernacular name, this tuber very closely resembles a fat white worm. They are certainly not inviting to look at, but are really most excellent eating. An effort is being made to get the Kachins to cultivate them.

6. *Orchard.*—There were added to last year's stock of trees—those which were received in November as well as the successful grafts. Arrangements are being now made for the supply of 1,000 indigenous fruit-trees in order to multiply the number of trees by means of grafting. Hitherto it was impossible to carry out grafting operations on a large scale as the English varieties were too young to supply sufficient scions for the purpose. By the time these operations are taken in hand, *i.e.*, the end of February, these young trees will be able to furnish all that will be necessary. Most of the trees received from England

last year, except apples and pears, blossomed, and some have set fruit, notably peaches and plums. Those which were received from Saharanpur and the Southern Shan States have set a fair number of fruit.

Aphis, I regret to report, again attacked a number of peach teees; the disease was taken in time and cured by rather drastic treatment, which consisted in nipping off every leaf attacked and then spraying the trees thoroughly with a strong solution of Nequas. This treatment curiously enough has in no perceptible way injured the trees, which are now in full leaf again. The fruit on the plum trees received from Saharanpur set early in February and are now ripening fast. I regret not having the name of this plum as it is undoubtedly a desirable one to grow owing to its early ripening qualities, besides being of a good size and exquisite flavour. The peaches and nectarines are also of a fair size, but have as yet shown no signs of ripening. Whether the rain will effect them injuriously remains to be seen. The American dewberry flowered for the first time this year, but failed to set fruit; also the English gooseberries and currants, with similar results. A considerable number of filberts have thrown up fresh shoots from their roots and their trees are now bearing nuts, which promise to mature.

The strawberry crop was a very poor one indeed and the failure entirely due to the head gardener neglecting to properly prepare the soil.

7. The main difficulty during the dry season, which fortunately has now ended, was the supply of water to the trees. The only means at my disposal were two bullocks and four men. Both bullocks and men were kept at work from 6 A.M. to 5 P.M., with a couple of hours' rest only to allow them to get their food. The number of trips which the animals were able to do from the water tank to the tubs into which the water was stored for distribution by hand to the trees was 15 during the day. Each tree, it was found, could only receive about four gallons once in every four days. This drawback will, I hope, be remedied next year by the use of force-pumps, which I am glad to say have already been indented for.

8. *Distribution of trees to Chiefs.*—No attempt has yet been made to distribute trees to Chiefs as the orchard is still young and, as already pointed out, has not been able to raise sufficient numbers by grafting. Before closing this report I regret to place it on record that the head gardener has done little or no work and does not appear to possess the amount of knowledge with which when he came here he was credited.

STATEMENT A.—*Actual total receipts and disbursements from the 1st June 1900 to 11th May 1901 (year under report).*

Receipts.	Amount.	Disbursements.	Amount.
	Rs. A. P.		Rs. A. P.
By budget allotment, *i.e.*—			
(1) Gardener at Rs. 40 ...	480 0 0	On orchard	2,723 15 11
Four under-gardeners at Rs. 15	720 0 0		
(2) Purchase of seeds ...	500 0 0		
(3) Upkeep of garden ...	300 0 0	Balance in hand	676 0 1
(4) Clearing, fencing, trenching, water-supply of orchard.	800 0 0		
5) Miscellaneous contingencies ...	600 0 0		
Total ...	3,400 0 0	Total ...	3,400 0 0

STATEMENT B.—*Details of disbursements from the 1st June 1900 to 11th May 1901.*

Details.	Amount.
	Rs. A. P.
(1) Establishment (pay up to end of April 1900)	1,197 10 10
(2) Clearing, fencing, garden, &c.	266 3 7
(3) Purchase of seeds	384 12 9
(4) Miscellaneous contingencies, *i.e.*, for carriage of trees and daily labour coolies ...	425 4 9
(5) Irrigation tank	450 0 0
Total ...	2,723 15 11

D. W. RAE,
Civil Officer, Sinlumgaba.

REPORT ON EXPERIMENTAL CULTIVATION IN THE CHIN HILLS FOR THE YEAR 1900-1901.

THIS is the second annual report submitted, and deals with the year ending 31st March 1901.

Grant.—The grant for the year under report was Rs. 1,250 as against Rs. 1,230 last year.

Expenditure.—The total expenditure under all heads has been Rs. 1,225-10-9 as against Rs. 911-8-0 last year.

Receipts.—For the first time the produce of the garden at Falam, with the exception of potatoes, onions, and strawberries, were supplied to the inhabitants of the post on payment of a small monthly subscription. The subscription commenced from the 1st June 1900. During the months when the supply was good, officers paid a subscription of Rs. 2 per mensem and clerks Re. 1. During July, August, and September these rates were lowered as the produce was exceptionally small. In future I propose that the subscription be Rs. 2 per mensem throughout the year. The receipts under all heads reached the total of Rs. 209-5-0.

At Tiddim and Haka small vegetable gardens are maintained, but, as only a very small sum can be allotted for each, and as this sum has to be supplemented out of the pockets of the few officers stationed at each of those two posts, in order to enable the gardens being maintained, no monthly subscriptions are levied. At neither of these posts is there any demand for vegetables beyond that of the officers themselves.

Fruit-orchard.—No great advance is shown in fruit-trees in the Falam orchard, very few of which have shown signs of bearing any fruit. Ten plum trees planted two years ago died during the year, the roots having been eaten by some unknown insect. Several cuttings had, however, been taken off the trees and these cuttings promise to do well. On closer inspection seven of the trees shown last year as peaches were found to be apricots. Both the peach and apricot trees are doing well, but are too young as yet to bear any fruit. The apples and remaining plum trees have made no perceptible advance in growth. All the trees have been pruned and fresh soil and manure put round the roots, but I am afraid it will be two or three years before they produce any fruit fit to eat.

At Tiddim Mr. Bateman discovered that several of the apple and plum trees had sprouted up in separate trees from close to the roots. He at once separated them and planted them in separate pits. He has thus managed to increase the number of fruit trees at Tiddim from 15, as shown last year, to 33. He reports that all these trees are doing well, and that the peach trees, which are not three years old, show signs of bearing a fairly good crop of fruit. All the trees at Tiddim were pruned and manured in July. The complaint at Tiddim is the want of water during the cold and hot seasons. During the rains the trees appear to be coming on well, but during the dry season they drop back. The water-supply at Tiddim is exceptionally bad and removed some distance from the post, and so it is impossible to fetch sufficient water for the trees. A scheme has been mooted to conduct water into the post from a spring distant some 2 to 3 miles from the post. If feasible, steps will be taken to put the scheme into effect.

At Haka the fruit trees, plum and apple, appear to be doing fairly well. The plum trees have several berries on them, but I doubt if they will ripen this year. The trees at all these posts have a healthy appearance and, with care, should produce fruit in two or three years' time. Seeds of the Peppicollobrium were planted at Falam and Tiddim. During the rains the seeds sprouted, but the cold weather killed the young plants.

Walnuts were planted at Falam in March 1901, but up to the present no signs of them have been detected.

Potatoes.—Two bags of potato seeds were received from Taunggyi, Shan States, in May 1900. Although the season for planting potatoes had passed, they were sown and the entire crop proved a failure. A bag of seeds received last March was sown and promises to do very well. I propose issuing potato seeds to Chins in the Falam and Haka subdivisions and encouraging them to grow them. The demand is very considerable and the supply is small, and, unless the Northern Chins, who grow potatoes in considerable quantities, bring them to Falam for sale, we have to resort to the bazaar, where the prices are excessive. The Siyins in Tiddim subdivision grow a large quantity of potatoes and make a remunerative trade by selling them. I see no reason why other tribes should not be encouraged to follow their example. By doing so, not only could they meet the wants of the foreign population of these hills, but they could also supply the inhabitants of the plains adjoining the hills. By this means an extensive export trade could be established. The potatoes grown by the Siyins this year do not appear to be of such good quality as those grown in former years. No explanation is forthcoming as to the cause of this, and I can only think that either the seeds were sown at the wrong season, or else the crop from which the seeds was obtained was a bad one. I hope soon to be able to furnish them with a new lot of seeds, and for this purpose I would request that six bags of potato seeds be supplied next January from Taunggyi. That potatoes will grow in these hills there is no doubt of, and I see no reason why in time as communication with the plains improve, the Chindwin district should not be furnished with potatoes grown up here.

Strawberries.—The outturn of strawberries at Falam last year was so good that it was decided to open out more beds. This was done and the outturn this year has been exceptionally good. During February and March 111 pounds of fruits were obtained and sold at 4 annas a pound, realizing a sum of Rs. 27-12-0. An equal quantity of fruit was obtained in April, but the receipts realized from the sale of the fruit will be included in next year's report.

The plants did not commence to fruit till February and the berries they supplied were very fine ones. I propose opening out more beds next year as the demand for the fruit is very great.

At Haka the plants fruit later than they do at Falam. The reason for this is that Haka is at a higher elevation than Falam and the climate considerably colder. A fairly good crop of fruit is anticipated.

Vegetable garden.—During the dry season the vegetable garden at Falam furnished a plentiful stock of different varieties of vegetables and all the European households in the post as well as the clerical staffs received a daily supply. During the rains the following varieties only could be grown,—French beans, carrots, turnips, and cabbages. During the dry months cauliflower, celery, and beetroot did very well, and a fairly considerable supply of each was obtained.

It was intended to plant asparagus during the dry season, but as the preparation of the beds required special attention, and as both Mr. Street, Assistant Superintendent, Falam, and I were absent from headquarters during the cold-months, it was decided to postpone the experiment till next year, when special attention could be paid to it. The rhubarb seeds obtained proved to be bad and no results were obtained. Mr. Street has applied for short leave to England. If the leave is granted, he will bring out from England fresh rhubarb seeds and also cuttings of gooseberry and currant trees. Both gooseberry and currant seeds were sown, but they did not germinate.

A good outturn of Spanish onions was obtained at Falam and 728 pounds at 2 annas a pound were sold.

At Tiddim onions, spinach, cucumber, vegetable marrow, parsnips, and Brussels sprouts proved failures, due probably to the fact that they were sown at the wrong time of the year. Other vegetables, such as radishes, turnips, beet, carrots, tamatoes, beans, cabbages, &c., did well.

Establishment.—The establishment consists of one gardener and one servant, both of whom are retained at Falam.

The great drawback to all gardening and experimental cultivation is that no experienced gardener can be induced to come to these hills. We have consequently to get along as best as we can and gain experience by watching various results. The gardener is illiterate and knows perhaps a trifle more about gardening than he does about any other subject. His ideas of gardening are very primitive and, if left to his own devices, he would produce some very quaint results. However, he is the only man procurable, and, although he has gained no experience since last year, yet he has committed no damage which a more ignorant man might easily do. Mr. Street, Assistant Superintendent, Falam, has given great attention to both the garden and orchard at Falam, and it is due to the care and attention bestowed by him that such good results have been obtained. As both he and I have often to be absent from Falam for considerable periods, the garden has to be left to a great extent entirely in the hands of the gardener. If an experienced gardener could be obtained, very much better results, I am sure, could be obtained. Small monthly allotments are allowed to the Assistant Superintendents, Tiddim and Haka, to maintain the gardens at those posts, and these sums admit of hired labour being employed on the gardens. At Tiddim during the dry season the entire allotment is swallowed up in paying coolies to carry water to the garden.

Wheat and oats.—A suitable plot of ground was found near Minkin post and was cleared to permit of oats being sown. Seed was obtained and some of it sown in October, but the experiment proved a failure, as most of the seed had been damaged by rain in transit to the hills. Some of the remaining seed, which did not appear to be damaged to quite the same extent, were sown in March 1901, and it is too early to report about the result as yet. Fresh seed will be obtained early next cold season and, provided the seeds are received in good condition, I see no reason why the experiment should not succeed.

General.—For the first time since the introduction of the experimental cultivation in these hills, slight receipts have been obtained from the sale of the produce of the Falam vegetable garden. At present the sales are restricted to the inhabitants of Falam only, there being no demand for vegetables outside the post. I think, however, that potatoes grown up here might obtain a sale at Kalemyo and Kalewa in the Upper Chindwin district, and I propose extending our operations in this direction.

A strong wire fencing was placed round the orchard at a cost of Rs. 156-12-0, whilst Rs. 116 were expended in enlarging the vegetable garden. This latter sum included the cost of clearing and enclosing the land and in laying down a new water-supply.

The rains were normal and no exceptionally heavy storms were experienced during the year.

Steps are being taken to improve the appearance of Falam by planting trees about the post. Holes have been dug and manured and, as soon as suitable trees can be obtained, they will be planted. I have written to the Conservator of Forests, Northern Circle, Mandalay, asking his advice as to what trees are likely to do best in this climate, but so far no reply has been received. I shall be much obliged if any information on this point could be furnished. Pines and rhododendrons abound in these hills, and a few are to be found in the station. Small trees of each sort will be planted, but other varieties of trees, more especially shade-giving trees, are required.

As pointed out earlier in the report, the great drawback to all gardening in these hills is the want of a really experienced gardener. If the services of one could be procured, very much better results could be obtained, but up to the present all efforts to obtain one have failed. If the services of a man could be lent for a year or two from one of the Government gardens in India or from Taunggyi, to teach our present gardener, it would be great step gained and our experiments would soon show better results.

E. O. FOWLER,
Offg. Superintendent, Chin Hills.

REPORT ON EXPERIMENTAL CULTIVATION IN THE SOUTHERN SHAN STATES FOR THE YEAR 1900-1901.

As this is the 10th Annual Report submitted, it may be useful to those who are thinking of starting similar work, or starting similar cultivation for profit, to make a cursory review of what has been effected in the decade, what the total expenditure has been, and the value of the property acquired.

The experiment commenced in 1891 with the view of introducing the cultivation of vegetable garden produce, wheat, potatoes, and European fruits. At that time none of these things were grown in the Shan Hills or even known to the people.

In 1891 and 1892 the work was confined to the growth of vegetables in a small plot of land of about 1 acre at Taunggyi in the State of Yawnghwè and the distribution of a small quantity of wheat-seed to cultivators in the neighbourhood and of seed potatoes to cultivators in the Myelat division.

At the end of 1892 permission was obtained to extend this to the growth of European fruit-trees, and on the 17th September 1892 a commencement was made to clear waste land. The land was selected to have a hill side facing the west, another facing the north, and another facing east. At the foot of these slopes is a flat basin of alluvial soil and soil washed off the slopes. The waste land was covered with scrub jungle growth and grass, and, by the end of 1892, 20 acres had been cleared and arrangements made for fruit-trees from different gardens in India, and also some few from England.

In 1893 the orchard commenced. The commencement was made under most unfavourable circumstances as my only gardener was a Burman (Maung Sè), a peon of my office, who had never seen such fruit trees in his life and had no notion whatever as to their cultivation.

I also had to be away on tour from November to May or June annually. All my endeavours to secure the services of an efficient gardener were unavailing until 1895, when the services of Mr. T. A. Colyear were obtained, and he remained until May 1896, when he left. Maung Sè then became head gardener and remains so to the present.

Of the trees put down in 1893 scarcely one is now alive, and of those put down in 1894 there are but few. The greater part of the trees now in fruit were planted or grafted on stock *in situ* in 1895 and subsequently.

In the meantime experiments were carried on by me during the rains in the growth of wheat and potatoes between the rows of trees, with great success, and in the meantime the cultivation of the same was fostered among the cultivators, who came to see how it was done, and so, by degrees, the cultivation of these, and also of gram, took a firm hold, and, in the localities where it was originally started, these have now become established crops. The want of a railway to carry the produce to the markets in Burma is the only reason that it has not spread immensely. In 1894 a further extension of 20 acres was made in the orchard, which is now a little over 40 acres in extent.

In 1896 the growth of wheat was extented to Kēngtūng for the purpose of supplying the troops there. Since 1897 no fostering aid has been needed for the cultivation of potatoes in the Myelat principally, which had then become an established crop. The same is the case with wheat-growing in the Yawnghwè State and neighbourhood, which has ceased to rate as an experiment since 1898, and this year concludes the experiment at Kēngtūng, which will for the future be left to the cultivators.

The orchard of 40 acres is now fully planted up with European fruit trees, the greater portion being grafts on indigenous stock and, as will be seen by the accounts at the end of this report, the orchard has become self-supporting.

It contains the following trees:—

	Trees.
Apples of 65 varieties	2,033
Pears of 48 varieties	1,216
Plums of 24 varieties	182
Cherries of 10 varieties	125
Peaches of 23 varieties	121
Nectarines of 9 varieties	79
Apricots of 11 varieties	55
Figs of 2 varieties	28
Cherrymoya	28
Walnuts	33
Filberts	4
Quince	6
Mulberry	1
	3,911

This gives about 100 trees to the acre, including roads, a quickset fence, and a plot of some 2 acres used for vegetables, strawberries, and nurseries, all at present well stocked.

Thus, in addition to the benefit to the people of the Shan States and to the country at large of the introduction of wheat and potatoes as crops, and orchards now forming in several places in these hills and elsewhere of European fruit-trees, and the growth in many parts of European vegetables, this valuable property is left as a substantial asset.

The cost of the whole operation since it commenced as a small vegetable garden in 1891 of 1 acre in extent to the end of the year 1900-01 now under report has been as follows. These figures are taken from the annual reports, which are checked in the Treasury annually before submission :—

Year.	Receipts.	Expenditure.
	Rs. A. P.	Rs. A. P.
1891-92	63 1 3	1,373 9 1
1892-93	2,663 1 6	5,387 15 8
1893-94	2,309 4 4	3,728 9 1
1894-95	957 7 2	*4,287 3 4
1895-96	5,249 13 7	6,538 13 8
1896-97	4,558 14 11	6,676 8 2
1897-98	5,941 15 1	3,125 2 3
1898-99	1,808 1 5	3,247 15 9
1899-1900	1,778 3 3	3,843 13 10
1900-1901	3,480 13 2	3,315 10 6
Total ...	28,810 11 8	41,525 5 4

* Deducting Rs. 1,000 erroneously charged for house for head gardeners in that year.

Deducting the total receipts from the total expenditure for the decade, we have the cost of the present property as Rs. 12,714-9-8.

The results should be encouraging to would-be beginners either in the experimental line to introduce new crops and industries, or as a commercial speculation.

Having thus reviewed roughly the operations for the decade as an introduction to this report, I will now confine myself to the operations for the year.

2. *Grant.*—The grant for the year was Rs. 4,100, none of which, however, was expended, or, if expended during the year, was paid before its close.

3. *Expenditure.*—The total expenditure has been Rs.3,316 against Rs. 3,844 for last year.

4. *Receipts.*—The total receipts from sales has risen from Rs. 1,649 to Rs. 3,481. There is still a small balance due on bills not yet paid of Rs. 99-9-0. The receipts on sales has therefore more than doubled during the year, and this is principally owing to the better rate obtained for the potato crop and the demand for young fruit-trees, every one of which, with the exception of a few cherry trees, were sold. Deducting therefore the total receipts *plus* the outstandings, which I have every hope of realising, the receipts have exceeded the expenditure by Rs. 265. This, too, has accrued from actual produce of the orchard and vegetable garden without the adventitious aid of wheat grown by cultivators from seed supplied and merely passing through my hands to the Commissariat Department. Financially therefore the results of the work for the year may be regarded as satisfactory.

5. *Work for the year.*—The vegetable garden, which as reported last year had to be moved to a spot within the orchard area, has now become fairly established. The old asparagus stools, 7 years old, which were moved, gave an excellent crop, and the new beds

made from seed sown in September 1899 and planted in the present beds at the end of that year have also given most abundant cuttings of as fine heads of asparagus as can be grown anywhere since March 1901. Some of these heads when cut have a diameter of an inch at the base and average some 6 inches in length and are tender and excellent for eating almost to the base. I have noted this as it is not usual to move asparagus stools 7 years of age, or to cut abundantly from a young bed not yet 18 months planted. These cuttings continue daily up to the present, and from previous experience I anticipate they will do so till the end of the rains.

The Crown artichokes, also removed from the old garden in October 1899, have given a most luxuriant crop of crowns and still continue to do so.

Several thousands of seedlings of indigenous fruit-trees shown last year have been grafted or budded during the year and are now strong and vigorous maiden plants, while all those grafted or budded last year have been sold. A large quantity, I am glad to say, have been taken by the Shan Chiefs, who, as the fruit trees come in to fruit, take more and more interest in their culture.

Young nurseries of the indigenous fruit-trees as stock have been sown and will be ready for budding and grafting in January-February and up to the middle of March next, which season I find gives the best result.

The scheme started last year of having four probationers for instructions from the Chiefs of the Myelat has on the whole worked well. It is true that the regular work and regular hours demanded from them was at first not to their taste; by degrees every one of the four men originally sent for instruction returned to their States. They were not selected by the Chiefs from the agricultural classes and could not stand the regular labour demanded. The men who have been substituted appear to be quite as intelligent and, being of the agricultural class, they can stand the manual labour. I have great hopes of turning them out in due course as fair rough gardeners who will know how to select land for an orchard, how to plant the trees supplied, and how to prune and tend them afterwards. This of itself would be a good substantial return for the time and money spent on this orchard. I notice that a somewhat similar attempt to train gardeners has been made by that most energetic and successful Superintendent Mr. Gollan, who has so kindly assisted me with advice and plants for the orchard and garden here. The following is a cutting from that most useful of periodicals *Indian Gardening and Planting*, for April 18th, 1901 :—

Training of Gardeners.

"WE are very pleased to publish the following notice, and hope that pupils will be forthcoming. We would advise Anglo-Indian youths to take advantage of this opening :—

NOTICE.

"THE Superintendent of the Government Botanical Gardens at Saharanpur is prepared to receive pupils for training as practical gardeners under the following conditions :—

"(1) The person who sends a pupil must pay him a suitable allowance for his maintenance. Rupees 6 per mensem would be a fair allowance for ordinary pupils. No fee is charged for instruction.

"(2) Pupils should be not less than 16 or more than 30 years of age.

"(3) The time occupied by the course depends on the pupil's capacity and diligence. A pupil with any practical knowledge would complete his course in about a year, but the full training of a pupil with no previous knowledge or aptitude might extend to three years.

"(4) Training in special branches of work, such as vegetable gardening or fruit growing, will be given when required.

"(5) Pupils will be required to work with their own hands and to obey the rules as to hours of work, &c., in force in the garden.

"All communications connected with the training of pupils should be addressed to The Superintendent, Government Botanical Gardens, Saharanpur."

The terms made by me with my probationers are precisely similar, except that the person who sends the pupil has to contribute Rs. 6 per mensem, the same being paid from the funds of the orchard in consideration of the actual work obtained from him. No man could be found in these parts to do any kind of work under Rs. 12 per mensem.

The grubbing up of the old scrub jungle roots has continued and much progress has been made. As it has to be done by the permanent establishment, when other urgent work is slack, it is a long job. I am unable to employ outside gangs of coolies as heretofore as the fruit trees are now a fair size and require care. Many of them are also in fruit.

As usual one-third of the trees in the whole area received a good mulching of farm-yard manure. Several hundred cart-loads were thus used. I am beginning to speculate whether this army of cockchafers are brought in with this manure. At present, however, I have not been able to come to any definite conclusion. By this method of mulching one third of the area every year each tree gets a mulching every three years.

The gardeners' cottages and godowns have all been repaired and are now in good preservation. The roadside trees in the station have also been pruned and attended to.

Some crowns of rhubarb and seakale, and tubers of Jerusalem artichokes have been added to the previous stock in the vegetable garden, and some Begonia tubers and other bulbs to the flower garden. Mr. Gollan, Superintendent of the Government Botanical Gardens, Saharanpur, kindly sent me many of the latter for trial.

6. *General remarks.*—As heretofore all the labour in the orchard and gardens is from the indigenous population and, as this has now been going on for ten years, some knowledge of our method of cultivation and the profit to be made from it is gradually making itself felt. I have had excellent strawberries, peaches, cabbages, cauliflowers, carrots, turnips, and other vegetables brought to me when out in camp, grown by the local chief or official.

All the trees were much earlier in bloom than they have hitherto been. The peaches commenced to flower in December, plums in January, and the apples in February. The peaches therefore and plums also have been picked to a great extent before destruction by insects, which come in such hordes at the commencement of the rains in May. If this continues, it will be a further encouragement to grow these fruits.

Some netting to preserve these soft fruits from *insects* was ordered from England through the Secretary of State last year. This has not as yet been received, but as the bulk of the peaches and plums had been picked and sold before the insects abounded, this long delay in supplying it has not had the serious result that it would have had in previous years.

The apples, being now forward and some approaching maturity, have this year for the first time been attacked by hordes of small beetles, which are committing great ravages. At least one-half of the fruit on the trees will thus be destroyed. For such young trees, however, the crop is a very heavy one. These insects appear to attack only the larger and softer kinds of cooking apples and so far have not attacked the harder sorts, as the pippins. It will probably be found that some of the varieties now fruiting will not pay to grow on this account.

There was no rain in March and only 51 cents in April, and this drought committed some havoc among the rhubarb and seakale plants.

The hordes of cockchafers observed for the first time last year are as bad or worse this year, and are fast stripping the young fruit trees of every variety of their leaves. In two nights they completely stripped some very fine scarlet runners, eating leaves, beans and flowers. The stalks like so many wires are all there is left. How to combat them I have no idea, and can only hope that it is not to become an annual plague. What little growth there was on the vines was eaten in the same way. I have given up all hopes of being able to grow grapes.

7. *Establishment.*—The strength of the establishment remains the same and the *personnel* nearly so. His Honour the Lieutenant-Governor inspected the orchard in March, and as a token of his appreciation of the good work done by the head gardener, Maung Sè, he sanctioned a small increment of Rs. 10 per mensem to his pay. The revised rates of pay as reported by me last year has had a most beneficial effect as none of the old hands have left during the year. The probationers entertained in May 1900 have by degrees all left, but new men have been substituted. The head gardener Maung Sè and the clerk Maung Po Si have worked well and given satisfaction throughout the year.

8. *Vegetable garden.*—Now that this has been fairly established in its new site, the supply of vegetables is excellent and is sufficient to supply six houses regularly. There is always some difficulty in keeping up the supply for the last few months of the rains, and the supply was then somewhat deficient. Now that the garden has become better established and the soil mellower, I shall hope for better results this year. The old plants of seakale have done well and the system of bleaching through sand is still working well. As already stated, however, some of the younger plants and also the rhubarb crowns were killed by the prolonged drought.

The total expenditure on the garden is now hard to gauge as the principal item used to be the gardener's pay. Now, however, there is no separate gardener, as the vegetable garden and orchard are worked by one gang. The sale of vegetables, however, has increased to Rs. 294.

9. *Wheat.*—A small quantity of seed wheat was issued to the cultivators at Kēngtūng and sown during the year. I have as yet no details of the result of the crop.

The crop is said to have been a very good one. A separate report on this will be submitted later. Under the orders of Government, there will be no further issue of seed, the cultivators being left to make their own arrangements. The wheat crop in the Yawnghwè State I am told has been a partial failure owing to rust caused by rain in February. The cart-hire to the railway has gone up and the prices ruling there up to date are very low. The continued growth of this cereal is likely for the future to be confined to local requirements until the railway it is now proposed to make becomes an accomplished fact.

Potatoes.—As mentioned in my report for 1899-1900 the production of this crop also had received a serious check in consequence of the enhanced cost of cart-hire and the large shrinkage in prices ruling in Burma. In many instances in the Myelat, after selling at the ridiculously low rate of eight annas per 100 viss (365 lbs.), large areas were left undug. As a result, the sowings of potatoes for this year's crop were very limited and the rate ran up proportionately. Instead of selling at eight annas per 100 viss, or of not digging at all, prices this year went up to Rs. 15 or higher; some sales were effected as high as Rs. 20 per 100 viss. This once more set every one wanting to sow for the crop now in the ground, but as every one had sold all he could lay his hands on there was a dearth of seed. The quantity

exported therefore has fallen from 46,380 maunds in 1899-1900 to 26,189 maunds for this year, and a still further falling off is probable for 1901-02, simply because seed was not procurable in sufficient quantity. If seed had been available, a very large increase might have been looked for.

In the orchard between the fruit trees 800 viss was sown in April 1900. Besides this, tubers left in the ground when digging the previous crop came up in some parts so freely that I had them hoed and tended. No outside labour was used, all the work being done by the regular establishment. From these sources 15,758 viss were dug, and as these were sold, some at Rs. 15 per 100 viss and some at Rs. 16, the sum of Rs. 2,366 was realized. From this, however, has to be deducted Rs. 1,061 as cart-hire to the railway, so that nearly half of the receipts went in cart-hire.

For a cold weather crop 600 viss was again put in at the end of September, but most failed to germinate for some reason or other, and those that did perished for want of rain or for some other cause, so that only 365 viss were dug in February—about half the quantity of seed sown. It is difficult to account for this total failure, as there was as much rain as in former years, except on the grounds that, as potatoes have been grown on the same land now for so many years in succession, the necessary plant food in the soil has become exhausted.

The failure, from whatever cause, has been a great loss, as there were no seed potatoes to be had in the Shan States and the Director of Land Records also failed to get me a supply from India.

All the seed I could get together to sow for the present rains crop in April 1901 was 355 viss, and about one-half of that was very indifferent seed, though of the former good kind.

To give it a chance, however, the land has been well dressed with farm-yard manure, the basic slag I tried last year being an utter failure. The seed has germinated fairly well and so far the plants look very strong and healthy.

As with wheat so with potatoes. There is every inclination on the part of the Shan agriculturist to grow them both, but until we get a railway to carry away the crop no increase upon the present production may be permanently looked for; on the contrary the cultivation of both must gradually fall off. It is therefore with no little pleasure and expectation that we are now watching the survey operations for a railway which have commenced this year. It seems to have put new life into the country already.

The potatoes grown in the Taunggyi orchard have acquired a well-earned reputation for quality throughout Burma, and every year seed is asked for from different places.

This year the following seed tubers were supplied:—

	Viss.
His Honour the Lieutenant-Governor	250
Deputy Commissioner, Katha	160
Deputy Commissioner, Myitkyina	25
Superintendent, Chin Hills, Falam	20
Total ...	455

11. *Orchard.*—The crop of strawberries commenced in December, and the berries were as fine and as plentiful as ever, and I never saw the plants look as strong and thriving. Every year a sprinkling of dried grass or straw is placed round the plants to keep the berries free from the soil. This is done when I am absent on tour, and this year I was much astonished to get reports towards March that the plants had almost ceased to fruit and what there was was very small. I attributed it to an insufficiency of water, and ordered accordingly. Nevertheless, on my arrival back on 15th March the plants presented a truly lamentable appearance—the leaves had shrunken to half their size and the flowers the same. They looked fairly starved. It was clearly not for want of good soil or want of water. I saw that in the place of the usual sprinkling of grass or straw, however, that the plants were fairly smothered in a thick carpet of it, the plants appearing to be growing out of the straw. I could only account for their loss of vitality by this carpet of straw thus preventing the light, air, and sunshine from getting at the soil. I at once had it removed and the soil slightly stirred, but to the present the plants have recovered no vitality and have the same stunted starved appearance. I have noted this fully in the hopes that perhaps *Indian Gardening* or some casual reader will favour me with his view as to the cause of this previously unexampled falling off. Every year heretofore the plants have commenced fruiting in December and gone on until water-logged by the rains in the following May.

The basic slag tried last year as reported had no effect whatever on the crop or plants, which were left from last year's plants in order to test the efficacy of this manure. It is clearly no use for either strawberries or potatoes in this soil.

The peach crop has been a fair one and, as they commenced to ripen in March and continued until the heavy rain in May brought the plague of insects to life, the pickings and sales were largely in excess of last year, Rs. 70 being realized instead of Rs. 43-8-6 last year.

The nectarine trees showed a very heavy bloom, but there is a very little fruit set. The trees are young and bore a very heavy crop last year, which no doubt accounts for it.

The apricot trees continue to grow and flourish as heretofore and some of them showed a few blossoms. Not a single fruit has set, however. The trees and root pruned in February 1900 have been checked in their strong growth, but so far still refuse to flower or to fruit.

The plum trees that showed fruit for the first time last year had a fair crop this year, while the more forward trees were very heavily laden. They were allowed to ripen on the trees this year and some of them are of most excellent flavour and size.

The cherry trees still refuse to flower or fruit. The growth of the grafts, however, continues to be luxuriant, while that of the imported parents is as stunted as ever.

The pears also still refuse to flower or fruit, though the growth is all that could be desired. There are a few of the 1894 trees alive and doing well, but they show no signs of fruiting, with the exception of one, on which is one pear. One of the 1895 trees has also one pear on.

The apple trees planted in 1896 have a large crop on them and many of the grafts on *Docinea Indica* stock of 1897 and 1898 also continue to fruit well, and a few of the 1899 grafts show fruit. As already stated, however, the insect plague is committing such ravages that, if I pick half the crop, it is more than I expect. There are two nice-looking apples on a *Pirus Pashia* stock grafted in February 1900. I made a counting again this year of the result of grafts on *Docinea Indica* stock in February 1900 in one nursery. In all 622 grafts were put in of 61 varieties. Of these 551 are now alive, while 71 died of that rust described in my previous reports, or about 13 per cent. When I commenced with this *Docinea* stock in 1896 the death from this cause was 80 per cent., so that we have improved. Last year it was 17 per cent. Some kinds, I notice, are much more successful than others, and of the following not a single plant failed :—

(1) Rymer.
(2) Sturner's Pippin.
(3) Hawthornden.
(4) Blenheim Orange.
(5) Dutch Mignon.
(6) Skye House Russet.
(7) Lane's Prince Albert.
(8) The Queen
(9) Golden White Pearmain.
(10) Celine Pippin.
(11) Wodhurst Pippin.
(12) Newton Pippin.
(13) Golden Reinette.
(14) Kentish Pippin.
(15) Peasgood Nonsuch.
(16) Yellow Fugistin.
(17) Lord Suffield.
(18) Gascoigne's Seedling.
(19) Grenadier.
(20) Gold Medal.
(21) Beauty of Bath.
(22) Duke of Devonshire.
(23) Bess Pool.
(24) Early Harvest.
(25) Fairy.
(26) Nonpareil.
(27) Ostin Pippin.
(28) Duchess of Oldenburg.
(29) Chelmsford Wonder.
(30) Lady Sudely.
(31) Potto Seedling.
(32) Bismarck.

It is early yet to decide which of the many varieties will pay the best to grow as there are a good many qualities to be tested. It is apparent this year that insects destroy some kinds more than others. This is a point to watch and observe in the future as, however, desirable in other ways, if the insects destroy the whole crop on a tree as in some cases, or half of the crop as in many cases, year after year, those varieties should be discarded.

The shooting of the bulbuls which committed such havoc last year has had a most excellent effect as they have committed no hayoc at all this year. Did they destroy the insects as well as the apples? This must be observed and considered.

The grape vines I give up as hopeless. They do not grow with any will, and what little growth they make is cleared off entirely by insects at this season annually. Spraying is of no use, as a shower comes and washes it all away and a horde of insects come in the night and devour every leaf and young shoot. If grown, it must be in a house which can be closed at night. The figs continue to do well and are now loaded with fruit. The boring Longicornis has not attacked them the last two years as it did previous to that. Perhaps the plague of cockchafers we have had for the past two seasons will again disappear in the same way.

The English walnuts continue to grow slowly, but they look healthy. Mr. S. Eardley-Wilmot, Conservator of Forests, Northern Circle, Upper Burma, kindly sent me some seed of the Himalayan walnut which has germinated well and several trees of which have been planted out.

The orange trees, which commenced to show fruit on a few of them last year, show fruit generally this year and in considerable quantities. The fruit last year was fine in size, but wanting in sweetness, which I am told is always the case at first. They have commenced to fruit much earlier than is usual as the young seedlings were only planted out in 1893, the seed having been sown in 1892. In a few years there should be an abundance of fruit.

I have now to mention a fruit which was picked for the first time last year and of which I have noticed lately much mention made in *Indian Gardening*, and this is *Anona Cherimolia* or, as it is generally known, *Cherimoyer*. In or about the year 1895 or 1896 (I regret

to say I cannot find my record) the Secretary to the Agri-Horticultural Society, Rangoon, was kind enough to send me a small packet of the seed of this tree. As I was as ignorant then as most people are now as to the growth of the tree or its fruit, I made a fatal error. Out of the packet of seed a few germinated and five only grew to be large enough to plant out, and these were planted out too close together. Two of these died in the succeeding year, leaving me three trees only. These three trees had grown to large and luxuriant shrubs by last year and were crowding one another. One bore 15 fine fruit, which were as delicious as depicted by Firminger. The fruit is, to look at, a large custard-apple, but twice the size, and ripens in the cold weather from December to February. When picked with the frost on it in a cold weather morning and eaten it might well be taken for a good lemon ice-cream. Notwithstanding that these shrubs had reached a height of some 16 feet and were most luxuriant in growth, I transplanted the centre one in March last and thus gave them all room for light, air, and expansion. I am happy to say that the transplanted tree is doing well and, beyond being thrown back, is apparently none the worse for its removal. The remaining trees have had a profusion of bloom and are still in flower, but not 1 in 500 seem to set. Altogether, however, there is a fair show of fruit now on these trees, and I hope many may yet set. I should like, however, to assist the fertilising process artificially, but have not yet ascertained the means of doing so. It is a handsome tree and a luscious fruit, and is well worthy of a place in every orchard.

I see from a cutting from the *Naturalist's Sojourn in Jamaica* that Mr. Gosse is fully aware of the excellence of the fruit, and *Indian Gardening* rejoices that there should be one ripening in the gardens of the Agri-Horticultural Society of India. I note, however, that it is expected to ripen in April, the middle of the hot weather. Mine only flowers in May and ripens in the cold season. There is something wrong somewhere; perhaps mine is not a *Cherimoyer* after all.

From a later paragraph in *Indian Gardening*, dated the 28th March last, I see that the time I was enjoying the 15 fruit off my two trees here for first time the Curator of the Hakgala Gardens, Ceylon, was enjoying 30 fruit off one single tree there, also for the first time. I shall be curious to see what the respective trees do in the fruiting line during the coming year 1901-02. The fruit, I see, ripens as here in the winter months and the size of the fruit is about the same. I may still hope therefore that mine is the real Simon Pure. From the seed of the fruit eaten last year I have increased my trees by 28 and have a good many to spare.

The trees issued gratis from the orchard this year are much fewer than usual and consist of—

	Trees.
Roses	134
Apples	22
Pears	2
Cherry	24

also 200 cobs of American maize.

12. *Flowering plants.*—The flowering plants were augmented by some fine Dutch bulbs sent by Mr. Gollan for trial. Among these the following grew and flowered well and made a good show:—

Narcissus.	Grape hyacinth.	Jonquil.
Hyacinth.	Daffodils.	Fresia.

The following grew well, but did not flower:—

Tulip.	Ranunculus.	Snowdrop.

Some bulbs of begonias were also received from Messrs. Hugh Lowe and Company. Every bulb is growing and most of them are now in full flower and make a most magnificent show. The azalias mentioned last year are most of them dead: none have flowered. The camelias have acted the same. The tree peonies are almost all alive, but are neither as large or healthy looking as when brought from England in 1898. Some cyclamen grown from seed sown in 1898 also made a good show and have formed fine bulbs. All the rose cuttings in stock in the orchard have been sold or distributed and none have been put in this year as the trees appeared to suffer from having been cut back too much. The fuschias have done excellently and a large stock has been raised from cuttings. The original plants are now loaded with flower to an extent I never saw before, and clearly demonstrate that both soil and climate suit them. Of the geranium and pelargonium cuttings received from Mr. Gollan I regret to say that scarcely any have struck. There is, however, one very pretty pink flowering oak-leaf geranium now in flower.

The trusses are unusually large and the colouring is exceedingly pretty. I shall ask him to send me some more so as to make another trial, especially with the pelargoniums.

13. *Financial.*—The result of sales *versus* expenditure may be considered as satisfactory. The sales should gradually increase year by year until the railway opens, when the increase should be marked. The expenditure during the year may be considered as normal and allows of but small margin for decrease. That there should be a small balance in favour of the fund is better than could have been hoped for.

14. *Concluding remarks.*—A list (not printed) of the fruit trees *in situ* in the orchard is appended. The stock was taken quite recently. The young trees look strong and healthy and one-third of them was mulched with farm-yard manure during the year. Some of the plants put down in 1893 and 1894 that linger on and have grown little, though not dead, should be renewed with young trees on indigenous stock as soon as it can be done. Some tea seed was distributed among the Palaungs of the Lawksawk State and the Taungthus of the Myelat in 1899. It arrived late in the season, however, and but little of it germinated. A second maund of seed was distributed last year, 1900, with better success, and I have asked for half a maund for distribution again this year. The people seem very keen to get it and really give it all the care and attention they can, but the cultivation is new to them. I hope by this means to give the Palaungs a crop that will pay them as well as their opium crop, the growth of which is prohibited in these parts.

The railway so long prayed for now really seems to be within the range of practical politics as the survey has been sanctioned and work started. It is at first to extend to Taunggyi only, from some point on the Burma main line. With that the prosperity of the Southern Shan States will be assured and the food supply of Burma considerably enhanced.

A. H. HILDEBRAND,
Superintendent and Political Officer,
Southern Shan States.

TAUNGGYI:
The 17th June 1901.

APPENDIX III.

STATEMENT No. I.—*Description of seeds received, together with the cost of distribution during 1900-1901.*

Seeds.		From	Date of receipt.	Cost of consignment.	Cost of distribution.
Description.	Quantity.				
				Rs. A. P.	Rs. A. P.
Havana and Virginia tobacco seeds	24 lbs.	Messrs. D. Landreth and Sons, Philadelphia, U.S.A.	7th June 1900 ...	202 2 0	12 6 0
English vegetable seeds ...	15 lbs.	Messrs. Sutton and Sons, Reading, England.	27th August 1900 ...	350 2 10	.....
Groundnut	35 bags.	Messrs. Gallois Mont Brun and Company, Pondichery.	7th May 1900 ...	256 11 8	10 6 0
Jute seed	60 lbs.	Director, Land Records and Agriculture, Bengal.	8th March 1901 ...	13 13 0	6 13 0
Atriplex nummularia (Australian salt bush)	2 lbs.	Messrs. Anderson and Company, Sydney, Australia.	17th July 1900 ...	10 8 0	.....
Paspatum dilatum (fodder-grass) ...	30 lbs.	Ditto ...	11th March 1901 ...	164 10 0	.....
Eucalyptus (Citriodora) ...	10 pkts.	Secretary, Agri-Horticultural Society, Rangoon.	14th August 1900...	10 0 0	.....
Cyphomandra betacea (tree tomato)	4 oz.	* Superintendent, Botanical Gardens, Hakgala, Ceylon.	4th June 1900 ...	.....	.....
Paddy	8 bags.	Deputy Commissioner, Prome ...	21st June 1900 ...	24 1 6	6 11 0
Tea seeds	1 md.	Davenport and Company, Calcutta ...	6th December 1900	43 0 0	6 0 0
Nauthabu plantain	100 shoots.	Deputy Commissioner, Bassein ...	15th June 1900 ...	.....	.....
Sugar-cane	500 tops and 75 canes	Deputy Commissioner, Thatôn ...	.....	9 2 0	6 4 0
Potato seeds	120 lbs. and 320 viss.	Southern Shan States and Shwebo Jail	.....	.....	.....
			Total ...	1,023 2 6	48 8 0

* Free.

STATEMENT No. II.—*Distribution list of seeds obtained for experimental cultivation during the year 1900-1901.*

Serial No.	How distributed.		Tobacco.		English vegetable seed.		Groundnut.		Jute seed.		Paspalum dilatum (fodder-grass).		Potato seed.	
	District.	Designation or name of officer receiving seed.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.	Quantity.	Date.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			lbs.				Bag.		lbs.		lbs.		lbs.	
1	Akyab	Deputy Commissioner.	2	30th July 1900.	...	7th September 1900.	...	7th May 1900.	...	12th March 1901.	...	14th March 1901.	...	
2	Kyaukpyu	ditto ...	1		...		...		...		...		...	
3	Tharrawaddy ...	ditto ...	...		...		...		35		...		...	
4	Bassein	ditto ...	...		...		...		...		...		...	
5	Myanngmya ...	ditto ...	...		...		...		...		...		...	
6	Thôngwa	ditto ...	3		...		...		15		...		...	
7	Henzada	ditto ...	2		...		...		10		...		...	
8	Amherst	ditto ...	1		...		...		...		...		...	
9	Thatôn	ditto ...	2		...		...		...		...		...	
10	Tavoy	ditto ...	1		...		...		...		...		...	
11	Thayetmyo	ditto ...	...		...		3		...		...		...	
12	Pakôkku	ditto ...	2		1		3		...		5		...	
13	Minbu	ditto ...	...		...		6		...		5		...	
14	Magwe	ditto ...	...		1		...		...		2		...	
15	Mandalay	ditto ...	...		1		2		...		1		...	
16	Ruby Mines ...	ditto ...	...		...		1		...		...		...	
17	Katha	ditto ...	1		1		...		...		...		...	
18	Bhamo	ditto ...	...		1		2		...		...		...	
19	Myitkyina	ditto ...	2		1		2		...		...		20	24-1-01
20	Sagaing	Commissioner	...		1		3		...		...		...	
21	Shwebo	Deputy Commissioner.	1		1		2		...		3		...	
22	Lower Chindwin ...	ditto ...	2		...		2		...		2		...	
23	Upper Chindwin ...	ditto ...	2		2		2		...		...		300	31-8-00
24	Meiktila	Commissioner	...		1		...		...		...		...	
25	Meiktila	Deputy Commissioner.	...		...		3		...		3		...	
26	Myingyan	ditto ...	2		1		3		...		5		...	
27	Yamethin	ditto ...	...		...		3		...		2		...	
28	Chin Hills and Mindat	Superintendent.	...		1		...		...		...		...	
29	Southern Shan States...	ditto ...	...		...		...		...		...		...	
30	Northern Shan States	ditto ...	...		2		...		...		...		...	
31	Chin Hills, Falam ...	ditto ...	...		...		...		...		...		438	3-5-00
	Total ...	...	24		15		35		60		30		758	

The following were also distributed—

Sugar-cane { 500 tops and canes to Deputy Commissioner, Sandoway.
{ 75 tops and canes to Deputy Commissioner, Minbu.

Eucalyptus seed, 10 packets to Deputy Commissioner, Katha.
Tree tomato, 1½ ounces to Deputy Commissioner, Katha.
Paddy, 8 bags, to Deputy Commissioner, Katha.
Tea seeds, 1 maund, to Superintendent, Southern Shan States.
Atriplex nummularia (salt bush seed), 2 lbs. to Deputy Commissioner, Myingyan.
Nauthabu plantains, 100 shoots, to Deputy Commissioner, Minbu.

STATEMENT No. III.—*Experimental cultivation.—Tobacco seed.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		Lower Burma.	
1	Akyab ...	Distributed to the cultivators of the Naaf and Rathedaung townships.	The experiment failed in Naaf township. In Rathedaung township it proved successful and produced about half a maund on an area of 0·15 of an acre.
2	Kyaukpyu ...	Distributed to cultivators through the Township Officers of Ramri and Cheduba.	The experiment was successful in Ramri township, but failed in Cheduba.
3	Thôngwa ...	Grown on sandy loam and clay soils. Planted in October.	The experiments were made in Danubyu and Yandoon townships. The experiment proved a failure in Danubyu, owing to the attacks of insects; but a fair amount of seed has been obtained for cultivation during the next year. In Yandoon, although the experiment was not so successful as that of last year, it produced 3,650 lbs. of tobacco, and the local value which prevailed is Rs. 55 per 100 viss. The experimenters report that the seed supplied this year was not as good as that of last year so the leaf obtained this year was very much smaller.
4	Henzada ...	.....	Owing to the carelessness on the part of the clerk of the Land Records Department the tin of tobacco seed was not opened until the month of December. The seeds were then sown but proved a failure.
5	Amherst ...	Distributed to Township Officers and Thugyis.	Failure, except at Kado, where the experiment was fairly successful.
6	Thatôn ...	Distributed to Township Officers.	The experiment was very successful in Bilin and partially successful in the Hlaingbwè and Kyaikto townships; elsewhere failed owing to the attacks of insects. The Deputy Commissioner recommends that the experiment at Bilin be repeated on a larger scale as the leaves of the tobacco are large and smooth and the flavour is liked by many people.
7	Tavoy ...	Seed distributed in four townships, manured with cattle droppings and irrigated with well water.	The experiment was a failure, owing to heavy rain and insects in three townships, and in the Yebyu township 7 lbs. of tobacco were obtained from ¼ lb. of seed.
		Upper Burma.	
8	Pakôkku ...	Distributed to Thugyis in the Yesagyo and Pakôkku townships.	In Yesagyo the experiment was made in three villages. In Ngalan and Kyunbyat villages the experiment was fairly successful and samples of the leaves were submitted for inspection; but in other places it proved a failure. In Pakôkku the experiment, as in last year, proved a failure, which is ascribed to want of rain and want of interest.
9	Katha ...	Distributed to cultivators in the Katha and Tigyaing townships.	Failure, owing to want of rain and excessive rain after sowing.
10	Myitkyina ...	Distributed to the Subdivisional Officers of Myitkyina and Mogaung.	The experiment was successful in the Sinbo circle of the Myitkyina subdivision and produced about 1,060 lbs. of tobacco; but in others it proved a failure owing to heavy rain and unsuitable soil.
11	Shwebo ...	Distributed to Township Officers.	The experiment was successful in Tazè township as in previous year; elsewhere failed owing to want of rain and the attacks of insects and sandy deposits.
12	Lower Chindwin.	Seed distributed in nine villages	Failed generally owing to heavy rain; a want of rain, but slight successes in Ma-u and Hkothan villages.
13	Upper Chindwin.	.....	Report not received.
14	Myingyan ...	Grown on alluvial land, not irrigated. Planted in August.	Failure owing to heavy rain.

STATEMENT No. IV.—*Experimental cultivation—English vegetable seed.*

District.	Cabbage.	Cauliflower.	Radish.	Carrot.	Turnip.	Khol rabi.	Beet.	Tomatoes.	Peas.	Beans.	Lettuce.	Celery.	Onions.	Reasons for failure.
Pakôkku	S. 4	S. 2	S. 1	S. 1	S. 2	S. 2	S. 2	S. 4	...	S. 2	S. 4	S. 2	...	Want of care and attacks of insects.
Magwe	...	...	...	...	...	...	...	...	...	...	...	...	...	Report not received.
Mandalay	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	
Katha	S. 2	S. 2	S.	S. 2	S.	S.	S.	S. 1	S. 2	S.	S. 2	...	S.	Want of rain and neglect in out-stations.
Bhamo	S. 1	S. 2	S. 1	S. 1	S. 1	S. 1	S. 1	S. 3	S. 2	S. 1	S. 1	S. 1	S. 1	Attacks of insects.
Myitkyina	S. 2	S. 2	...	...	S.	S.	...	...	S.	S.	S.	...	...	Attacks of insects and bad soil.
Sagaing	S.	...	S.	S.	S. 3	S. 3	S. 3	S. 3	S. 3	S. 3	S. 3	S. 3	...	Heavy rain in Sagaing subdivision and want of rain elsewhere.
Shwebo	S. 2	S.	...	...	...	...	...	S. 2	...	...	...	...	...	Attacks of insects.
Upper Chindwin	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	†	† Unsuitable soil.
Meiktila	S. 3	S. 2	S. 2	S. 3	S. 2	S. 3	S.	S. 2	S. 2	S.	S.	S. 2	...	Bad soil.
Myingyan	...	...	...	...	...	...	...	...	...	...	...	...	...	Bad selection of ground and attacks of insects.
Chin Hills (Mindat-Sakan) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	Seed has just been planted. Experiment shows signs that it will be successful.
Northern Shan States ...	S.	...	S.	S.	...	S.	...	S. 2	S.	S.	S.	...	...	New ground and want of water.

N.B.—The blanks represent failures, the letter S stands for a successful experiment, and where the experiment has been tried in two or three different places, the numerals show the number of successful experiments.

STATEMENT No. V.—*Experimental cultivation—Ground-nut.*

No.	District.	Particulars regarding experiment.	Result of experiment.
		Lower Burma.	
1	Thayetmyo ...	Distributed to Subdivisional and Township Officers.	Failed; the failure is attributed to heavy rains but ground-nut grows well in Kyauksan village.
		Upper Burma.	
2	Pakôkku ...	Distributed to the Subdivisional Officers, Pakôkku, Pauk and Gangaw.	The experiment proved a failure, with the exception of Pauk township, where the result was fair. The failure in Tilin was due to unsuitable soil.
3	Minbu ...	By revenue surveyors ...	The experiments were made in five different places in Sagu township. In two places the experiment was fairly successful; but in others it proved a failure, owing to heavy rainfall in July and August.
4	Mandalay ...	Grown on sandy soil, not manured or irrigated. Planted in July.	Failure, owing to want of rain and ignorance on the part of the cultivator.
5	Ruby-Mines...	Distributed to the Subdivisional Officers, Tagaung, Momeik and Mogôk.	Failed, owing to heavy rains, except in Momeik subdivision, where about 144 lbs. of ground-nuts valued at Rs. 9 were obtained.
6	Bhamo ...	Grown on Tanè on Myènè soil, not manured or irrigated. Planted in July.	The experiment was successful and produced about 4,752 lbs. of ground-nuts. The Deputy Commissioner states that these ground-nuts are of better quality than those imported from the Shan States.
7	Myitkyina ...	.....	Failed, owing to unsuitable soil. No more seed for experiment is required.
8	Sagaing ...	Distributed to Subdivisional Officers.	The experiment proved a success in Sagaing township, but failed in others, owing to the soil proving unsuitable.
9	Shwebo ...	Distributed to Township Officers	Failed everywhere, owing to want of rain, attacks of insects, and delay in planting.
10	Lower Chindwin.	Grown on alluvial soil, not manured or irrigated.	The experiments were made in seven villages, but failed in every case, except in Nyaungbyubin village, where the experiment proved a great success. The failure is attributed to want of rain and the attacks of insects.
11	Upper Chindwin.	.....	Failure, owing to want of sufficient care on the part of experiment ersand flood from the Chindwin.
12	Meiktila ...	Distributed to the Subdivisional Officers, Thazi and Meiktila, Headquarters Magistrate and Superintendent of Jail, Meiktila.	The experiment tried by the Superintendent of Jail, Meiktila, proved a success; but in the others it proved a failure, owing to heavy rainfall in July.
13	Myingyan ...	Grown on alluvial land, not manured or irrigated. Planted in June.	The experiments were made in Myingyan and Kyaukpadaung townships. In both places they proved a great success.
14	Yamethin ...	.....	Report not received.

G. B. C. P. O.—No. 658, D., L. R. & A., 15-1-1962—266

00133918

Digitized with financial assistance from

Government of Maharashtra

on 01 February, 2020